OL. LII.
w Series Vol. 5, No. 6. FEBRUARY, 1918 $3.00 per Annum. Foreign, $3.60. Canada, $3.25. Single Copies, 30 Cents in U. S.

JOURNAL
OF THE
American Veterinary Medical Association

FORMERLY
AMERICAN VETERINARY REVIEW
(Original Official Organ U. S. Vet. Med. Ass'n)
EDITED AND PUBLISHED FOR
The American Veterinary Medical Association by Pierre A. Fish, Ithaca, N. Y.

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THE JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION is issued the first of each month. *Manuscripts and copy for insertion should be as nearly perfect as possible for the printer and should be received by the 10th of the preceding month to insure insertion in the next month's issue.* Volumes begin in April and October.

Communications relating to publication, subscriptions, advertisements and remittances should be addressed to JOURNAL OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION, ITHACA, N. Y. Matters pertaining to the American Veterinary Medical Association and Membership should be sent to Dr. L. A. Merillat, Secretary, 1827 So. Wabash Ave., Chicago, Ill.

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PIERRE A. FISH, Editor **ITHACA, N. Y.**

VOL. LII., N. S. VOL. V. FEBRUARY, 1918. NO. 6.

THE VETERINARIAN AND CONSERVATION

For the first time, the American people are facing the possibility of a serious shortage of food and clothing. The situation is known but the Government must have men for its task overseas and it must have munitions, clothing and food for its soldiers. To supply the army and the people at home with the necessary animal products, there must be greater efficiency, not only in production, but also in preventing losses from disease. The latter is a function of the veterinary profession.

The fact should be recognized that it is no longer possible to obtain our meat food products from animals brought in from the ranges where they have grown with little human protection or to gather our dairy products, wool and poultry from farms where animals are raised without loss from contagion. On the contrary, we are living at a time when meat, dairy products, wool and leather must come from animals that are raised as a part of agricultural activities, at much expense, as in European countries, and when death from disease means a positive loss to the food supply of the nation.

In earlier years, when segregation of animals was the rule, and when cattle, sheep and swine were abundant and of little individual value, the occasional loss from accident or infection was

not considered of much economic importance. There was little need in such circumstances for veterinarians and even less opportunity for them to treat food producing animals. For that reason, veterinary activities were restricted largely to the diseases of equines. This was especially true in the United States.

With the growth in population, the communicable diseases of domesticated animals, favored by association and the interchange of "carriers", have spread to an alarming extent under the methods of handling live stock. Affections such as Johne's disease, infectious abortion and sterility in cattle, anemia in horses, destructive poultry diseases and still others that a few decades ago were practically unknown in this country now present difficult problems. In addition the nation is confronted with an insufficient supply of meat and animal fats for food and wool and leather for clothing.

The seriousness of one phase of the situation was forcefully presented at the meeting of the U. S. Live Stock Sanitary Association in Chicago by Mr. H. R. Smith of the live stock exchange. He stated that in 1916, in seven of the large packing centers of the middle west, there were condemned and tanked, because of disease, 50 train loads of 40 cars each of cattle and hogs. If that was true of seven centers, what was the loss in the remaining 237 cities and towns having federal inspection and in thousands of other places where animals are slaughtered? In the city of Utica there were tanked in 1917, during the first six months of municipal inspection, 118 carcasses and over 10 tons of parts of carcasses because of disease. The report of the Chief of the Bureau of Animal Industry for 1916 shows that in that year 286,954 whole carcasses and 738,361 parts of carcasses of cattle, sheep, goats and swine were condemned for the same cause. The pity of it is that most of the diseases from which these animals suffered are preventable.

The condemnations by meat inspectors, however, do not circumscribe the economic losses from disease. The large number of animals that die upon the farms, the occult cases of infection that deteriorate the breeding herds and the human suffering that often follows the loss of animals that were intended to be exchanged for other food and suitable clothing all enter into the effect of animal diseases upon the food situation and the economic condition of the country. New York contains 13 per cent of the domesticated animals and about 7 per cent of the poultry in the United States. This determines the proportion of the extra efforts which fall to

the New York veterinarians in order to save the losses from disease. Likewise, it is not difficult to estimate New York's share of the total direct loss from these causes. On account of the large number of breeding herds in the state, it is not possible to measure the damage traceable to infection.

With the records before us of heavy, and apparently unnecessary, waste from disease, attention should be called to some of the improvements that must be made if the difficult task is accomplished of reducing these losses to a minimum. Many veterinarians are already in the country's service and undoubtedly others will be called. This alone increases the work of those who remain. Again, live stock owners have lost, through the draft and individual patriotism, many of the men they relied upon to care for their animals. In consequence of this, veterinarians should accept cheerfully their enlarged obligations and do many things in the care of sick animals that normally belong to the grooms and herdsmen.

V. A. M.

CONFIDENCE AND COOPERATION

In the grip of the existing emergency, what concrete efforts can be put forth to bring about the maximum conservation of animal life?

It has often been asserted by successful practitioners, that it would be possible for veterinarians to save a much larger proportion of affected animals than is accomplished ordinarily, if they could have the confidence and cooperation of the owners in order to follow up their cases until treatment was no longer needed. It is evident that success in practice and sanitary work requires the united effort of the veterinarian and the owner. Without it, there cannot be opportunity to apply the required preventive or therapeutic measures. As a further attainment for greater success in the prevention and treatment of diseases of animals, there should be brought about full cooperation between live stock owners and their veterinary advisers.

The veterinarian must be a missionary to carry the "gospel of prevention and sanitation" to animal owners and also he must be a teacher among them. In knowledge of animal diseases and their control, we are living in new times and under new conditions and these demand new methods. Farmers do not understand fully

how much assistance modern veterinary science can be to them. Methods that are imperative to prevent, treat, or control many destructive diseases have been known, even to the specialist, but a few years. They are technical and must be applied at the proper time and with precision if good results are to follow. With the veterinary standards of the past and the technical education of many animal owners, it is natural that veterinarians are not called always as early as they should be nor allowed to apply the necessary procedures except in acute cases.

The veterinary profession in this country has brought but recently to the relief of dumb creation efficient sanitation and scientific methods of diagnosis, treatment and control. This makes it the more necessary that owners should know what relief is possible for many diseases formerly believed to be necessary burdens to animal industry. The most effective way to convince the public that these things can be done is by demonstrating the successful application of modern hygiene, sanitation and therapeutics. The second requisite for a more efficient service is an understanding, on the part of live stock owners, of the many ways veterinarians are able to help them if they are consulted in time. This applies not only to the treatment of acute disorders but also to preventive measures.

The researches in the biological and medical sciences have illuminated the nature of disease and some of the laws which govern it. These studies have placed in bold relief many new facts and principles to be observed in the successful handling of morbid conditions. As a result, rational medicine has replaced largely the "isms" of former years and gradually the empiricisms of the past have given way to the principles of science. Clinicians are seeking the natural laws governing disease and their interpretation for they have learned that they cannot succeed by working against them. The acquisition of knowledge of one disease after another is readjusting both the theory and practice. The modern methods in making a physical examination, in utilizing a specific reaction for diagnosis, for immunization or treatment rest on definite principles in the biology of disease.

The application of the technical knowledge is the problem for the practitioner himself. Veterinarians should be interested sufficiently to acquire, through diligent study and constant vigil, the knowledge necessary to enable them to do and to advise the best

their profession can give. This point should be emphasized because of the existing, divergent opinions entertained concerning professional qualifications. There are, unfortunately, a few who protest against the necessity of a working knowledge of the facts and principles which govern the dissemination or treatment of different diseases. In the presence of the enormous losses occasioned by disease, men of such views are a menace to the animal industry of the country and a blot upon the profession. This is confirmed by the appeals for help that come to us from animal owners because their veterinarians tell them there is nothing that can be done to save their animals from diseases which they have been taught can be controlled. Calls of this character are becoming less frequent, but why can they not be stopped entirely? Are the veterinarians doing all they can to conserve live stock when those who honor themselves with the title of veterinarian are indifferent to the common knowledge of the sciences they profess to be able to apply? The third requirement to secure the maximum conservation of animal life, and the key to the other two, is a veterinary profession reconsecrated to its service. This means in addition to technical efficiency, the attributes of sympathy, good judgment and a conscience.

The Government and the live stock industry of the entire country are looking to veterinarians for greater protection against losses from animal diseases. The veterinary profession never found itself in a more conspicuous or trying position than it is in today. But with it all, the golden opportunity has come for it to intensify its efforts and to demonstrate its real worth. If this war is won, it will be due in part to those who successfully fight disease and pestilence among the food producing animals at home. The rapid progress that is being made in securing cooperation with owners, true estimation of veterinary service and application of advanced scientific methods in practice are encouraging for the present and good omens for the future. V. A. M.

EUROPEAN CHRONICLES

Bois Jerome, December, 1917.

Repair of Bones in Adults.—The long admitted process of the regeneration of bones has lately been the occasion for the presentation, before the Academie des Sciences by one of the highest

surgical authorities in Paris, Professor Quenu, of an interesting note, which has been published in the *Presse Medicale*. Its translation may, from the pathological point of view, interest our readers.

It is classical, since the work of Ollier, to attribute to the periosteum the predominant and specific part in bone development, whether it is considered in the physiologic osteogenesis of growth in children and young individuals or in that of repair in adults.

It is true, that growth once ended, the fertile layer, the osteogen of the periosteum, disappears in a normal bone; but for Ollier, this layer may reappear under the influence of pathologic irritation, and the periosteum, again temporarily fertile, remains in the adult as in the child the essential agent of osteoformation.

This notion, which dominates the surgery of bones, has appeared to the authors as erroneous. The numerous observations they have made on lesions of war wounds and those induced experimentally have brought them to conclusions which deny that the so called reactivated adult periosteum is a *bone creator*.

In adults, this belongs to the bone itself, it is in the *irritated* bone, *in the state of osteitis, that the process of ossification, still mysterious, takes its origin*, and will secondarily extend to the periosseous tissues and especially to the periosteum. To be effective, this process requires the presence of the inflamed bone, for a *sufficiently long time*. The invasion of the surrounding tissues occurs as a true *ossifying neoplasis*, developing itself most frequently under the form of *exostosis* (*endostosis* is more rare, and takes place in the medullary canal) neoplasis extends *by continuity* in the majority of cases but often also *by contiguity* (disseminated bony centers).

Therefore the ossification of the periosteum in the adult is a passive phenomenon *secondary* to an irritation of the bone, where the generating process has started. The faculty of ossification is not specific to itself, but is common to the connective tissue, with this point, however, that the periosteum remains in all ages the most prone to ossification, because of its close relation to the bone, its fibrous organization and its numerous blood vessels. The preservation of the periosteal membrane is, for the surgeon, of very great value.

To summarize: the process of ossification in adults is *an ex-*

clusively pathologic phenomenon, inflammatory—and not the return of lost physiological properties. The primary motive of this accidental ossification begins in the bone affected with osteitis, which must last a sufficiently long period upon the periosseous tissues. These invaded by a true ossifying inflammatory neoplasis will serve as a substratum for the development of new bone. The adult periosteum offers good ground for the development of this neoformation, but it does not generate the osseous process. This is the function of the bone.

Important practical conclusions of immediate applications in war surgery may be drawn from the above conception:

1st. In relation to the operation for the treatment of *recent wounds of bones*. It demonstrates the parts should be let alone, if the osseous regeneration is expected, and the practice of making large bony resections should be ignored; the loose portions (splinters or fragments), if removed too early, have not had time to "start" the ossifying neoplasis in the surrounding tissues. The osteitis alone is able to build up the new bone.

On the other hand, a tardy ablation where exact conditions are yet to be established will permit renewing osteogenesis to occur and will avoid the pseudarthrosis and the loss of substance which might otherwise result.

2d. In relation to the treatment of *pseudarthrosis*, the conception permits one to understand the paradoxical recovery consecutive to the development of an attenuated infection as it has been demonstrated, the phenomenon of osteitis being the specific stimulant of the repairing ossifying neoplasis, and one understands, in those conditions, the appearance of callus heretofore deficient.

For the same reason, and always under the condition that the infection be attenuated, the conception advanced justifies the use of metallic osteo-synthesis in recent war wounds and also the expectation from the irritation produced in the bone of an influence on the formation of the callus.

3d. In relation to the obscure mechanism of osseous grafting, the conception throws some light on valuable indications for operation. The essential part in the new osteoformation seems to be the return to an implantation of the *bony tissue itself;* this osteogenetic action of the implanted bone tissue is explained, in a great part at least, by the phenomenon of osteitis, which is developed in the graft and around it. It is this which elaborates the

ossifying neoplasis, a neoplasis of junction in the case of pseudarthrosis, of repairing in the case of loss of substance.

This osteogenetic role of osteitis agrees well with the condition of grafts which, instead of being interfered with by a slight infection, have benefited by it.

In opposition, the periosteum does not play a part in successful grafting. Grafting can succeed in the absense of all periosteum. The fine technic of Delbet for pseudarthrosis of the neck of the femur indicates it. An observation followed for eight months, observed clinically and radiographically, and where there was a loss of substance of the tibia, 6 centimeters in length, was filled with a graft, without periosteum, proved it beyond discussion.

Let us mention another deduction concerning the *formation of the callus in a closed fracture*, although it has no special interest. This formation which has given rise to so many different and contradictory theories, is explained by the phenomenon of *traumatic osteitis*, as it renders very simple the appearance of the intra-medullary and of the interosseous intermediate callus for which many have advocated an hypothetical intervention of the periosteum, which contributes only to the formation of the external callus by the same process similar to the starting osseous point described above.

This conception of the osteogenesis of adults is based upon numerous clinical observations, histological and radiographic which will receive later proofs of an experimental order.

Gaseous Gangrene.—Since the beginning of the war, gaseous gangrene has been the subject of numerous studies, and on a few occasions I have taken the opportunity to bring the question before our readers, taking advantage of the many publications which have made their appearance in the professional journals.

In the *Annales de l'Institut Pasteur* for September, two well known investigators, Doctors Weinberg and P. Seguin, have published a résumé of the results of researches they have made since September, 1914, as a preliminary note of the article they have prepared and which contains the complete details referring to their work.

This résumé is quite important, being divided into four chapters, viz: 1st—The bacterial flora of gaseous gangrene. 2d—The

bactero-clinical classification. 3d—The etiological factors, and 4th—the experimental reproduction of the disease.

It would be a difficult task to make a brief analysis of the lengthy résumé of the work of Drs. Weinberg and Seguin but we can cast a glance at the contents of the various chapters, referring the reader, anxious for more detailed facts, to the September, 1917, number of the *Annales*.

In the first chapter, that of the bacterial flora, we find the statement that in the cases observed by the authors they have "not met with a single case of gaseous gangrene caused by an aerobic microbe". They say that in all the cases they have studied they have "always found anaerobic, alone or associated with aerobic". For the anaerobic species they have found they made a statistical table which shows that among the anaerobic bacilli present, four were most frequent, the *perfringens*, the *sporogenes*, the *oedematicus* and the *fallax*.

For the aerobic germs the most frequent were the cocci (streptococci, diplococci, staphylococci).

The dangerous microbes of the gangrene are three anaerobic bacilli, the *perfringens*, the *oedematicus*, and the *V. septicus*.

The second chapter, the bacterio-clinical classification, is established upon such precise data that the different forms of the disease are grouped under three classes, the classical, the toxic and the mixed, each of which is considered and illustrated by the records of special cases.

The chapter on etiology treats of the considerations under which gaseous gangrene develops, with the principal etiological factors which are grouped into 1st, the mechanical and 2d, the bacteriological.

In the first group enters traumatism, the bony and vascular lesions. All of these factors are acknowledged by all surgeons and bacteriologists as primary in their importance.

In the second group, the part of the microbial associations on the development of anaerobics in the organism is taken into consideration.

The fourth chapter treats of the experimental reproduction of the disease, where it is demonstrated that the pathogenic part played by some anaerobics in gaseous infections is given by the study of the lesions found in inoculated laboratory animals.

The classical, the toxic, and the mixed forms have all been re-

produced, and after having thus proved the action of the anaerobic microbes, single or associated, in the development of gaseous infection, the procedure to prevent them efficaciously, is presented as follows:

"No doubt, since surgeons, educated by experience, freely incise and clean thoroughly all wounds and especially since they excise largely the infected, bruised tissues, cases of gaseous gangrene are much less frequent. Yet, there are circumstances when their propagation rises greatly.

It had been indicated to investigate what service serotherapy might render as an addition to the surgical treatment.

To solve this problem, we have prepared a serum against each of the three most dangerous microbes. Encouraging results have been obtained and we believe that a patient severely wounded ought to be preventively injected, as soon as possible, at the same time with the anti-gangrenous and the antitetanic serum."

THE PASTEUR INSTITUTE AND THE WAR.—If one reads the record of sanitary conditions which have generally prevailed in all times of war and carefully considered the etiology of the enormous spread of some diseases, whether in men or animals, the work done by the Pasteur Institute in Paris will only then be fully appreciated and the name given to the great institution by a correspondent in the French edition of the New York Herald, *the real factory of health*, will not be considered misplaced.

Having inquired how the war had affected the Institute, the Director, Doctor Roux, is said to have made the following remarks:

"Before the war our personnel numbered about 200 individuals, and of this number 126 were mobilized in August, 1914. This group comprised 41 doctors, 3 chemists, 6 veterinarians, 76 officers and soldiers. The laboratories for study and teaching were closed, only a few laboratories for research being allowed to remain open. Some of our investigations, which could not be allowed to be interrupted, have been kept going by a very limited number of people. Such are the departments of rabies, diagnosis, examination of blood, preparation of vaccines, vaccines for animals and the sero-therapeutic services."

Under present conditions, with the scientific progress made, with the great results obtained experimentally and practically it soon became evident that sero-therapy was destined to act a very

important part in the prevention and treatment of epidemics and epizootics, that were likely to break out and which for years have always been observed in various degrees during other wars.

The Pasteur Institute resources and provisions have been taxed to the utmost.

Nine million doses of vaccine against typhoid fever were distributed.

From 150,000 doses of antitetanic serum which was the reserve stock in peace time, the army was supplied with 4,000,000 doses. In ordinary times fifty horses were sufficient to produce the serum needed, now 600 are kept for that purpose.

The treatment for the destruction of vermin, for Paludic fevers, for dysentery, for cholera, for glanders and lymphatic diseases, etc., all were obtained at the Institute.

Bactero and serotherapy are reigning and as the Pasteur Institute can be considered as the head of this great therapeutic revolution, if one considers that it has supplied over two hundred military laboratories with the means for bacteriological and chemical researches, the conclusions will certainly be that it deserves, with all its other qualifications, the name of *Health Factory*.

MEDIAN NEURECTOMY.—Professors Coquot and Bourdelle of Alfort have written a masterly article on this classical operation which deserves the attention of anatomists and surgeons. The article relates to the topographical structure of the region of the median nerve and to the seat of the operation.

In the consideration of the anatomy, the internal face of the forearm and of the elbow region presents three plans: a superficial or cutaneous; a middle, subcutaneous or aponeurotic, and a deep or subaponeurotic. These three layers are successively described and their demonstration is illustrated by excellent plates.

This portion of the article is followed by the second which is the principal one, viz: the selection of the site for the operation and the technic belonging to it.

After a few remarks showing the objections that are justified in the classical operation of Pellerin, and summarizing the principal inconveniences of classic mesoneurectomy, viz: the difficulty of fixing exactly and invariably the seat for the operation, the frequency of vascular injuries, the useless resection of muscular nervous branches, with the contraindicated suppression of the in-

nervation of important groups for locomotion, the authors describe the technic of their modus operandi.

The horse being cast on the diseased leg, the superficial anterior limb is brought back and secured on the corresponding hind limb. Three fixed points are taken to determine the exact place for the cutaneous incision; the fold of the axilla, the projection of the elbow and the antero-inferior extremity of the horny chestnut. It is at an equal distance relative to these three points that the superior extremity of the incision must be limited.

The region prepared, with a convex bistoury an incision is made four centimeters long, involving the skin and subcutaneous connective tissue. If made well it is parallel to the radius, one and a half centimeters back of the internal border of the bone.

Dilate, by pressure, the median subcutaneous vein, which is forward of the seat of operation. If, abnormally and exceptionally, this vein is displaced backwards, carry the seat of operation in the same direction, following the posterior border of the blood vessel.

At the lower extremity of the cutaneous incision make a transverse one through the antibrachial aponeurosis, introduce under this a grooved directory, with the groove turned upwards and incise from below upwards the aponeurosis the whole length of the field of operation.

As soon as the aponeurotic incision is made, the great palmar muscle will bulge out, take hold of it with a blunt tenaculum with the aponeurosis and draw backwards so as to raise its deep surface. If the nerve is not apparent then, pull with another tenaculum the anterior edge of the incision. The median nerve will then be seen at the bottom of the exposed surface, resting on the muscle and in connection forward with the radial veins. Isolate it from the deep face of the muscle with the directory, take hold of it with firmly closed forceps and push it on the directory. Cut it with the bistoury, at the superior angle of the wound, and resect it at the inferior after rolling it over the branches of a pair of forceps. Suture the skin with separated stitches and apply a protecting dressing.

Cicatrization takes place by first intention and the horse can resume work after a month.

NICOTINE IN MANGE.—This is not a new treatment. The use of tobacco and its preparations, as excellent antipsorics, has been advocated for years. It seems that its economic value has not been considered when the presence of the disease, in an epizootic form, has rendered the use and service of a large number of horses extremely difficult and onerous as has been proved in the present conflict, where mange has existed in the armies.

Prevention is an essential necessity and much easier to obtain than to cure. This will be evident if one refers to the various treatments which have been advocated and compare the results with those that Principal Veterinarian Querreau has recommended in the pages of the *Revue Generale*. When the disease has been discovered the following antimange treatment is recommended. Strictly omit all local or general clipping of the hair. Resort *only* to the application of lotions, 3% of an extract of nicotine (made in solution of 30 grams of the extract, 1000 of water and 3 of carbonate of soda). Apply the solution every second day, after a dry friction with a coarse brush over half of the body. One to one and a half liters of the solution will be necessary. The first day the application is made on the front half of the body, the third day on the hind half and so on alternately until recovery is established. In cases of generalized disease, about ten applications are required while for cases where the lesions are limited, four or five will prove sufficient.

The results obtained by the application of this treatment were very satisfactory and mange in an army corps has been mastered without difficulty and without fatal cases of intoxication by nicotine. It was applied to many thousands of horses and mules.

It is applicable to both forms of mange, sarcoptic and psoroptic. The idea of this mode of treatment is due to Veterinary Major Deglaire, who thus solved the serious problem of the management of epizootics of mange in armies.

SUMMARY FROM RECENT PUBLICATIONS RECEIVED AND BIBLIOGRAPHIC NOTES.

Those marked "X" will be analyzed. Those marked "O" will appear in abstracts.

VETERINARY JOURNAL—October. An inquiry into the horse disease known as septic or contagious pneumonia—(O) The French operation for quittor —An extension apparatus for use during foot operations—(O) Surgical

treatment of compound fractures of the rib—(O) Foreign body in the pharynx of a horse—Notes on contagious bovine pleuro-pneumonia in Northern Rhodesia.

VETERINARY RECORD—October and November—(O) Interesting pig case—Struck by lightning—(O) Complete severance of carotid artery with spontaneous arrest of hemorrhage.

JOURNAL OF COMPARATIVE PATHOLOGY AND THERAPEUTICS—(X) A paralytic sheep disease in Peru—The early history of veterinary literature and its British development—(X) The relations between contagious pustular stomatitis of the horse, equine variola (horse pox of Jenner) and vaccinia (cow pox of Jenner).

VETERINARY NEWS—October and November. Rectal injury or rupture following coition in mares—Bogus lightning cases—Tetanus.

VETERINARY REVIEW—Vol. I, No. 4, contains 67 pages of abstracts from continental and American papers relating to the various branches of veterinary medicine.

REVUE GENERALE DE MEDICINE VETERINAIRE. Contribution to the study of lymphangitis of horses.

REVUE DE PATHOLOGIE COMPARÉE. Purgatives by hypodermic injections—A case of cirrhosis in a civette—Simplified method of Carrel in minor surgery.

LA CLINICA VETERINARIA. Researches upon the diagnosis of pregnancy in the cows, mares and goats with the method of Abderhalden—Notes on 52 new cases of umbilical and ventral hernia operated on by a radical extraperitoneal method—Anatomical and radiographic researches upon the ossification of the aortic fibrous ring of bovines.

IL NUOVO ERCOLANI. Some clinical characters of the synovitis of the great sesamoid sheath in horses.

BUREAU OF ANIMAL INDUSTRY. Journal of Agricultural Research—Some facts about abortion disease, by Dr. E. C. Schroeder and W. Cotton.

HOG CHOLERA, PREVENTION AND TREATMENT. Farmer's Bulletin, by Drs. M. Dorset and O. B. Hess.

CHICAGO VETERINARY COLLEGE Bulletin, September, 1917.

A. LIAUTARD.

—Major General Sir Robert Pringle, K.C.M.G., C.B., D.S.O., whose retirement from the position of Director of Veterinary Services has been gazetted, has been in ill health for some time. Graduating at the Glasgow College in 1874, his career in the Army Veterinary Corps commenced in 1878, and his war service included the Afghan, two Indian, and the South African campaigns—in addition to the present war. For services in the Boer war he was mentioned in dispatches and received the D.S.O. During the present war he was made a C.B., and in January, 1917, received the honor K.C.M.G. Sir Robert carries with him the good wishes of his colleagues that he may recuperate in health on his retirement, and live for many years to enjoy the rest to which he is entitled.—*Veterinary Journal.*

STUDIES IN BLACKLEG IMMUNIZATION WITH SPECIAL REFERENCE TO BLACKLEG FILTRATE*

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INTRODUCTION. Ever since the discovery of the nature of blackleg by Roux in 1887, investigators have directed their attention towards developing an effective mode of immunization against the disease. The successes attained along this line were highly satisfactory, although they have not resulted in the development of a product which would uniformly and effectively protect animals. Among the researchers who were especially active in these investigations are Roux, Kitasato, Kitt, Leclainche and Vallée, as well as Grassberger and Schattenfroh and above all Arloing, Cornevin and Thomas, to whom credit is due for the development of blackleg vaccination which has been most widely adopted.

While up to the present the various products which have been devised to combat blackleg by vaccination have without a doubt reduced the losses from this disease to a marked extent, nevertheless they have not been perfected to a degree which would place any of the methods as a wholly effective and safe procedure. Due to the shortcomings of the different methods of vaccination, investigators have sought to develop a product which would possess the greatest possible immunizing properties, and also be safe and controllable from the time of its production until the administration into the animal.

Up to the present time the most common method of vaccination which has been employed not only in the United States, but also in other countries where blackleg is prevalent, consisted of the injection of attenuated virus prepared in either pellet or powder form. The number of annual vaccinations with this product amount to many millions, and while the reports prove conclusively a value to the product as an immunizing agent, nevertheless the results are not uniformly satisfactory, as direct losses from vaccination are known to occur from time to time; and, furthermore, insufficient protection following vaccination is also of too common occurence.

*Presented at the 54th Annual Meeting of the American Veterinary Medical Association, August 20-24, 1917, Kansas City, Mo.

Powder and Pellet Vaccine. The vaccine prepared in pellet or powder form is the outcome of early investigations on blackleg immunization by Arloing, Cornevin, and Thomas to whom the honor belongs of developing the method of immunization known as the "Lyon Method". The principle of this immunization consists in the attenuation of dried juices from blackleg lesions of an animal which has succumbed to the disease. The obtained material is subjected to two different degrees of attenuation—one being exposed to a higher temperature and used for the first injection and the other attenuated at a lower temperature and used for the second injection. The injection is made into the dense tissue of the tail with the intention that the firmness of the tissue would prevent the rapid development of the reaction following the vaccination.

This method has been extensively employed throughout the world and the results might be considered highly satisfactory, although losses from vaccination and insufficient immunity have been observed from time to time. Furthermore, complications resulting from the injections, such as necrosis of the tail, etc., are not unusual.

Kitt in 1898, published the results of his experiments whereby he succeeded in simplifying the "Lyon Method"; his process requiring only a single injection, and he further recommended that it be made in the shoulder region where the skin is loose and easily pierced by the needle. For the preparation of the vaccine, Kitt utilized the affected muscle of the animal which was cut into strips, dried and pulverized in a drug-mill. The powder is then mixed with distilled water into a paste, filled into shallow pans and placed in the attenuating oven where it is subjected to a temperature of 95° for a period of six hours. The attenuated material is then ground into a powder which is prepared into either pellet or powder form (Government Vaccine),

In considering the method of preparation of the vaccine, it must be realized that the product is comparatively crude. Blackleg vaccine as marketed at the present time cannot be accurately standardized and a single dose may contain 100,000 or one million spores and at other times a much smaller number, if any. Such a variation would naturally result in irregularities of the immunizing action of the vaccine, and it is no doubt due to this fact that direct losses from vaccination and from the natural infection after vaccination, cannot be entirely avoided.

The short-comings of the blackleg vaccine lie mainly in the fact that in its production the virulence and immunity producing properties cannot be accurately enough controlled and tested. It is true that the vaccine is weighed or measured, but it is impossible to establish the amount and activity of the virus which it contains. Not only is it impossible to determine the amount of living vegetative blackleg organisms and spores in the tissues used for the vaccine production, but it is also impossible to estimate how much of the active material will survive the attenuation. The variation of the amount of virus in the affected tissues of an animal is, no doubt, considerable and the effect of the attenuation upon the virus may also vary in the different lots used for the vaccine production. The former views—that the individual organisms of a culture or of an infected focus are biologically uniform—can be no longer substantiated; and likewise, there is no longer any doubt that the individual vegetative form or spores possess a varying susceptibility toward exposure to higher temperature. Accordingly, the reduction of the number of organisms following heating is not always uniform. Thus, it is impossible to determine whether the original material used for the vaccine production contained an insufficient number of organisms or spores, or to what extent they might have been injured or destroyed by the process of attenuation. There are no scientific methods known to overcome these deficiencies.

In order not to bring this method into disrepute, it would be essential to eliminate these short-comings. It is a recognized fact that in blackleg vaccination sufficient immunity is only obtained in case the spores contained in the vaccine have actually germinated in the animal. To develop a vaccine of a potency which would always be capable of inducing only a very slight infection and at the same time to limit its action within safe borders, so that the infection does not become too severe or fatal, has not been attained by the present method.

A further technical deficiency in the preparation of the vaccine from blackleg meat and juices, consists in the irregular consistency of the vaccine powder and of the emulsion prepared therefrom. It is natural that the preparation of a homogeneous solution from the powder is almost impossible and if the vaccine contain clumps which have not been properly broken up, the results are naturally different than when a homogeneous emulsion is employed.

Liquid Blackleg Vaccine. In view of the imperfection of the vaccine prepared from the affected parts of a blackleg carcass, investigators have directed their attention toward developing other methods of vaccination by which these deficiencies might be overcome.

Attention was then directed toward developing a vaccine consisting of the attenuated cultures of the blackleg organisms. Kitt, Detre, Poels and others have employed blackleg cultures in which the organisms were attenuated in various ways for the immunization against blackleg. The results were not uniformly satisfactory. However, in various localities one or the other method has establised itself and is now being used to some extent.

Later, Leclainche and Vallée developed a liquid blackleg vaccine which they tested out very extensively and it is now being employed in different countries with fairly good results. The shortcomings of the liquid blackleg vaccine must be recognized since it is subject to the same deficiencies as is the Pasteur vaccine for anthrax, viz,—a careful standardization of the product is almost impossible; the keeping qualities of such a vaccine are limited; and furthermore, it is a recognized fact that the blackleg organism does not retain a uniform virulence upon artificial cultivation. These factors, no doubt are responsible for the fact that the liquid blackleg vaccine is not attaining popularity for vaccination against blackleg.

Immune Serum. With the advent of the development of the different immune sera for the prevention and treatment of diseases, the utilization of animals for the production of blackleg immune serum has also been undertaken. For this purpose, horses and cattle have been injected with cultures of blackleg, at first in small doses, which later are increased until as high as 500 cc are injected intravenously. Unfortunately, at the present time we have no means for an accurate standardization of such serum since it is a recognized fact that the laboratory animal tests are not entirely satisfactory for such purposes. The writer is now carrying out experiments by which the various products for blackleg may be more accurately standardized and the results along these lines are very promising.

It is natural that the use of the serum for the control of blackleg has its limitations. The injection of an animal with serum induces only a passive immunity which at best would protect the

animal for a period of only one month. However, in herds where the disease has already caused considerable losses, the animals might be subjected to the serum treatment, to be followed later by an active immunization. For curative purposes, blackleg serum is known to exert a very favorable action, but in this instance also it must be recognized that the disease runs a very rapid course and in most cases the administration of the serum would be rendered fruitless.

Germ Free Extract (Aggressins). More recently in this country, germ-free extracts (aggressins) have been highly recommended for immunization against blackleg. The products are obtained from animals artificially infected with the disease and the affected muscles and fluids are extracted by pressure. The fluid thus obtained is frozen in order to facilitate the filtration of the liquid. After filtering and suitably preserving, it is marketed about 5 cc constituting a protective dose for each animal. The results from vaccinations with this product are highly satisfactory and no doubt more reliable and uniform than with the blackleg pellets or with the powder. However, the cost of the production of such extracts is considerable and therefore the stock owner, especially since he is accustomed to expend only a nominal sum for the products used heretofore for vaccination against blackleg, would not readily take advantage of this product.

The immunizing action of the extract, no doubt, is dependent upon the specific toxic substances which it contains, and in consideration of the limited amount of such extract which is available from an affected animal the attention of investigators has been directed to the production of such specific toxins by artificial cultivation in the laboratory.

Investigations with Blackleg Filtrate. The first investigations on attempts of utilizing filtrates of bacterial growths of blackleg cultures for immunization purposes are recorded by Foth. He prepared a spore vaccine from mass cultures of blackleg organisms cultivated in peptone liver bouillon with the addition of a large amount of ground meat. The cultures were then precipitated with alcohol and the product which contained the spores as well as the metabolic products of the germs proved highly virulent in its action. By heating the same for 7 hours in a water bath at 93° this virus was attenuated in its pathogenicity to such a degree that it proved effective for immunizing purposes.

Moreover, Foth obtained by filtering his cultures through thick layers of paper pulp, a clear germ-free filtrate which by precipitation with alcohol yielded a product which proved highly effective for immunizing purposes, so much so, that a single subcutaneous injection produced an active immunity not only in sheep and cattle, but also in guinea pigs.

Japanese investigators have continued the work along the lines developed by Foth and established that a germ-free filtrate produced from mass cultures yielded a safe and effective product for blackleg immunization and at the present time the germ-free filtrate is used almost uniformly for vaccination purposes against blackleg in Japan. From information which I obtained personally from Professor Nitta, of the Tokio University, it appears that this product is placed above all others which we have at our command for immunization against blackleg, and I have been told that the filtrate appears to afford a uniform protection, and besides this, the losses following vaccination or incidental to vaccination are thereby entirely avoided.

Since the possibilities of producing an effective blackleg filtrate appeared very encouraging, we proceeded with experimental work to establish whether the claims made on the immunizing value of blackleg filtrate could be fully substantiated and also whether it would be possible to develop a product which would be more uniformly effective and more readily controllable in its potency than the products which have been heretofore employed for vaccinating purposes.

With this in view, special culture media containing a definite proportion of meat has been inoculated with active blackleg cultures which resulted in a very prolific growth with tremendous gas formation. On following this method of cultivation, it is noted in the first few days a very active propagation of the blackleg organisms takes place in the media, further, a disintegration of the meat is noted and a heavy layer of blackleg organisms settles to the bottom of the container.

With the cessation of the gas formation the media is acid in reaction which no doubt exerts an inhibitory action upon the growth. In the first few days, upon examinafion, it is found the growth consists of the vegetative forms of the organisms, and with the diminishing of the gas production, an increase of the spore form of the blackleg organism is noted.

At this stage numerous elliptical endospores and also the granular form of the organism are present in the culture. The conclusion of the growth is indicated by an entire cessation of the gas, and on the bottom of the container a heavy sediment consisting almost entirely of spores of the blackleg organism is present. At this time the meat appears to be disintegrated and becomes of a mushy consistency. For the preparation of the filtrate from the mass cultures they are subjected to various procedures to facilitate the task of filtering out the organisms, since it is absolutely essential that the finished product shall be entirely free from the spores or from the vegetative form of the organism. With this in view, the cultures are first filtered through paper pulp which procedure is repeated and then the filtrate is passed through Berkefeld filters. The technic of this procedure does not require any special skill and consists chiefly of the laboratory routine, employed along the same lines as those used for the production of other biological products.

In the course of the experiments, it suggested itself to determine whether other culture media than that described above might be employed for the production of a germ-free filtrate and with this in view duplicate tests were made with culture media—one containing the meat and one without the meat. The results were very convincing as to the necessity of having the meat in the media, since the filtrate obtained from this culture media possessed great immunizing value when tested out on calves, whereas the filtrate prepared from the media not having the meat failed to show any signs of protection. It was likewise noted that the gas production in the media containing the meat was tremendous, whereas in the other flasks only a moderate gas formation took place.

It appears, therefore, that in the production of a potent blackleg filtrate it is absolutely essential to include in the media a definite proportion of meat, since the addition of the meat is inducive for the development of certain specific toxins which are essential for the immunizing properties of the product.

The filtrate thus obtained has been subjected to animal tests in order to determine its immunizing properties both on cattle and guinea pigs. The results show conclusively that 5 c.c. of the filtrate afforded cattle immunity which protected them against injections of virulent virus in amounts which invariably killed the check animals. Guinea pigs which received one-half to 2 c.c. of the filtrate proved also to be protected against otherwise fatal doses of

the virus. In order to afford the maximum protection with the injection of filtrate a dosage of 5 c.c. was decided upon. Since, however, it appears advantageous to reduce the dosage to a quantity which can be more conveniently handled, attempts were made toward concentrating the filtrate. In order not to affect in the least the potency of the filtrate it was deemed necessary to accomplish the concentration at a temperature not exceeding 40° C. and for this purpose a special evaporation apparatus has been constructed along lines similar to the serum driers. Besides, a vacuum drier has also been used in which the evaporation could be accomplished within a very short time. The concentration of the filtrate has been successfully accomplished by either of the methods and after a concentration to one-tenth of its original volume it is mixed with a definite amount of a glycerinated preservative in order to increase the keeping qualities of the product. It is then again passed through Berkefeld filters and filled into the desired containers.

STANDARDIZATION. Besides the potency test on animals, experimental work is being now carried out in order to establish whether some of the biological tests might not be utilized for the standardization of the product. Along these lines the complement fixation and agglutination tests offer possibilities. Likewise the toxic principles of the product might be also advantageously utilized for this purpose. A test of the antigenic properties of the filtrate against an immune blackleg serum is also promising. These methods of standardization, however, are still in the experimental stage and it is hoped will soon be developed to a degree of perfection by which we will be in a position to accurately standardize the product. At the present we are dependent on the animal tests.

Guinea-pig tests which were at first employed exclusively for the standardization of the product proved that injections of 0.2 c.c., 0.3 c.c. and 0.5 c.c. of the concentrated material when followed in ten days' or two weeks' time with an injection of virulent blackleg virus, produced a distinct immunity in the animal, since the control pigs receiving the virus died and the immunized animals survived.

The tests on the guinea pigs should be carried out as follows: in all eight guinea pigs are used of which two serve as controls. Two of the remaining six receive 0.1 c.c.; two receive 0.4 c.c.; and two receive 0.6 c.c. of the filtrate. After ten days all pigs are in-

jected with 0.5 c.c. of virulent blackleg virus. The virus is prepared by taking dried blackleg tissue, pulverizing it and mixing it with distilled water in such proportions that there will be about equal amounts of fluid and sediment. Of this coffee colored mixture, 0.5 c.c. is injected into each guinea pig. It is required that at least four of the immunized guinea pigs should survive and that both of the controls should die from the injections.

The product has also been subjected to other severe tests on calves, in which the calves, after injection of the blackleg filtrate were subjected in two weeks' time to an injection of 5 c.c. of blackleg virus, an amount which is used to infect calves with blackleg for the production of vaccine. Five calves which have been inoculated in this manner resisted the infection and only in one instance did a swelling appear at the point of injection of the virus.

Immunizing Properties of Blackleg Filtrate. Experimental work with the filtrate has conclusively established that it possesses toxic principles which, when injected into test animals, will produce lesions similar to blackleg and kill the animals. From our investigations it appears evident that in blackleg the toxins produced by the organisms are responsible for the fatal termination. The fact that blackleg filtrate containing the specific toxins may be neutralized by antiblackleg serum is a substantiative factor of the immunizing value of the product.

Furthermore, our results are somewhat corroborated by the very recent investigations of Bull and Pritchett of the Rockefeller Institute for Medical Research on "Toxin and Antitoxin of and Protective Inoculation against Bacillus Welchii". It is a well known fact that the Bacillus Welchii, the causative agent of gas gangrene, now the destructive disease of the armies at war, resembles morphologically, biologically and in its culture characteristics very closely the bacillus of blackleg. In fact, differentiation at times can be only accomplished by the most painstaking biological tests. In its pathogenic action this organism also closely simulates the blackleg bacillus, and as already stated, in the article quoted, the work on blackleg filtrate has been in the main substantiated.

Bull and Pritchett claim that under suitable conditions cultures of gas bacilli produce true toxins to which their pathogenic effects may be ascribed. Our experimental work on blackleg confirms this fact with regard to the cultures of blackleg bacilli. They further maintain that there are produced at least two distinct

toxins, one of which is hemolytic, while the other causes local edema and necrosis and probably also a more general toxic action. This we find to be also the result of the blackleg toxins. The hemolytic action on the blood is best shown by intravenous injection of Berkefeld filtrates of cultures which contain the meat. On the other hand, the local destructive effects may be readily produced by subcutaneous or intramuscular injections of such filtrates, such lesions then resembling closely those which occur in the actual disease of affected animals.

They further claim that repeated injections of filtrates in pigeons and rabbits result in a true active immunity, and the blood of immunized rabbits neutralizes the toxic actions of the filtrate not only in the test tube, but also in the living animal with respect to the locally injurious actions, as well as the destruction of blood corpuscles. They have also found that the blood of rabbits which have received three injections of toxic filtrate from a given culture is capable of neutralizing not only that particular filtrate but the filtrate from four other cultures as well. These findings coincide with the action of blackleg filtrate as far as it has been studied and that we possess in this product true immunizing toxins which are responsible for the principal pathogenic effects in blackleg infection and again it is noted that in order to produce such toxins it is essential to add meat to the media, otherwise the production of these specific toxins is inhibited.

Duration of Immunity. With reference to the duration of immunity produced, all the investigations indicate that the period extends for about a year. That is, the same length of time as the immunity established by vaccine or by germ-free extracts. There is no conclusive information available whereby permanent immunity might be produced from the injection of any blackleg product. Of course, it is realized that the vaccination of calves with an effective product would induce an immunity which would protect the animal during its time of greatest susceptibility, and since the immunity produced by the vaccination vanishes only gradually, the proportion of infection in effectively vaccinated animals would naturally be very insignificant.

Summary. 1. Blackleg Filtrate is an effective immunizing agent against blackleg.

2. Blackleg Filtrate confers an active immunity, which protects cattle against the disease for as long a period of time as the

germ-free extracts (aggressins) prepared from the juices of the tissues from affected cattle.

3. Since it does not contain the blackleg germ in any form it cannot produce the disease, therefore losses incidental to vaccination with the powder or pellet form are entirely avoided.

4. Blackleg Filtrate may be prepared in a concentrated form and, when suitably preserved, will retain its potency for an almost indefinite period of time.

5. It is essential to subject the Blackleg Filtrate to the various tests for sterility, both during the filtration and filling processes in order to guard against any possible contamination.

Discussion

Dr. Goss: Doctor Eichhorn has covered this subject so thoroughly that I do not know of much that I can add. There are a few things to which I wish to call your attention regarding the powder form of vaccine. From the work done upon the powder vaccines, it seems that the degree of heat used in the attenuation is not of a great deal of importance, as it is found by heating to the same degree two lots, or one lot divided into two parts, that the virulence will vary somewhat. On that account it has been customary at the Kansas State Agricultural College, in testing the blackleg vaccine, to carry out the government test to show that it will not kill guinea pigs in doses up to 7.5 milligrams, also to carry on farther tests to show that it will kill in doses of 15, 25, or 40 milligrams. Accordingly it is made into single or double vaccine. This is done to determine that the vaccine still has some virulence as well as being safe to administer to cattle.

The results in the field show that in most cases it will protect cattle from blackleg, at other times it does not protect for more than 30 to 60 days.

We have had reports of cattle developing blackleg after the injection of some of this class of vaccine, with lesions at the point of injection, while other cattle will develop blackleg in the course of 60 to 90 days. This seems to show that when the vaccine is safer to administer, that it is not strong enough to produce a very high degree of immunity.

Regarding the blackleg serum: as Doctor Eichhorn has said, it is produced by immunizing the horse. This has a high protective property. We find that we can produce a serum from the horse which will protect guinea pigs against 60 M.L.D. of blackleg muscle virus, which is of a rather high protective property. The serum is of considerable use in the prevention of blackleg. It has been used in herds where the death rate was high, in which the loss was checked within 12 to 24 hours. It has also been used, in numerous

cases, upon animals ill with the disease, in which condition the recoveries have averaged about 50%. As blackleg is very acute, serum must be administered early. The immunity produced by the serum is of short duration, from 10 days to perhaps four weeks. On that account it is necessary to follow it, in three days, with a virus pill. These are made from the unattenuated muscle which is made into pellets. They are then heated to 60°C. for one-half hour in order to kill all non-spore-forming organisms which may be present.

This form of treatment produces a fair degree of active immunity. Out of 27,000 doses sold during the past year, 14 losses have been reported. I feel confident that the pills have not been administered in all cases.

Regarding the germ-free fluid vaccine (aggressin), which is made from the animal tissues, with which I am more or less familiar, as Doctor Eichhorn says, this material has quite high immunizing properties. We have used this material at the Kansas State Agricultural College for about two years.

To rely upon field reports for results is probably the best test, although some think these reports are of not much value.

During the past year we have sold 21,000 doses. Considerable was put out during the six months prior to this, of which we have no records. Up to July 1, only one death had been reported. To be sure, there may have been more, but when people buy a high priced product they are very apt to report losses, should they occur.

Regarding the filtrate made from culture which Doctor Eichhorn has produced, I am not in a position to state the results of that material, as it has not been upon the market very long and we have not had sufficient time to give it a test. We are running some tests upon it, endeavoring to find just what properties it has, but at the present time I have no definite information.

DR. GILTNER: I presume I was requested to discuss this paper because it was known by the officers of this section that I knew nothing about blackleg, so I give the opinions of one observing the subject from the side lines. I know that the time is limited, and the time I take will be in keeping with my knowledge of the subject.

I believe that many of us, outside of the section where this disease occurs, are somewhat shocked to learn that the old blackleg vaccine is not what we have been taught to believe that it is. It is as if the medical profession would tell us that smallpox vaccine is not what they have been taught to believe. Yet what Dr. Eichhorn says of the old blackleg vaccine is true; it is decidedly crude, it is incapable of standardization, it is dangerous, and favorable to the spread of the disease; and yet we never paid much attention to that fact because blackleg, it appears to me, is one of those diseases which gain a new foothold as fast as their footprints are eradicated. I have no knowledge whatever of this preparation which Dr. Eich-

horn discusses as a result of personal experience with it, but I wish to say just a few words from a theoretical standpoint in connection with it. First, I agree with Dr. Goss that Dr. Eichhorn has covered this subject, as he always does, as a hen covers a brood of chickens; but I think in this case there are some eggs that have not been hatched yet, and this western section, I believe, should be warned; and I wish a wiser man than myself would be called upon by our president to warn this section against this new preparation, against accepting it too hastily, and too unreservedly. I feel that this discussion blends in very nicely with that of Dr. Ward's paper. I think there is danger of this blackleg section being overwhelmed with this new product. There is danger of its being put on the market by commercial organizations which have not the facilities, either intellectual or otherwise, to prepare this product. Dr. Eichhorn made the statement that it does not require any special skill to prepare this product. That is a high compliment to you and to me, but I would not have said that if I were he. It seems to me that the preparation of a product like this requires the greatest skill and the greatest care, and it appears to me that the government now has one more serious problem on its hands in the supervision of this product. To those well versed in bacteriology there appear immediately innumerable loopholes in this product that do not appear to the untrained or superficial observer. I wish to close with this warning against accepting these so-called aggressins regardless of their source, and to the exclusion of other means of controlling this very important disease. I think in this connection, as in connection with all microbial diseases, the veterinarian must study his cases, although it is almost impossible for him to practice on these cases like a scientific physician.

DR. MAYO: There are one or two points regarding blackleg that have not been brought out. One is that blackleg is a very erratic disease in the field. Sometimes outbreaks will stop suddenly without any treatment at all, and in measuring results obtained by any product, the erratic features of this disease must be considered.

Dr. Eichhorn stated that the varying results obtained from blackleg powder vaccine is due entirely to its virulence and quantity of the vaccine used. I do not think this is correct. I am thoroughly convinced from years of experience in the west that the immunity not only of individuals but of herds of young cattle varies greatly. We have used the same vaccine, in the same manner, on different herds, and got widely varying results. In some cases with good results and in other herds it killed some animals. I attribute a part of the losses to the variation in the natural immunity of the individuals or herds under different circumstances. We do not know what causes the variation in susceptibility to blackleg.

Another point, in dealing with this problem I think that the papers coming from this association should use the recently adopted termination of "mils" rather than the old abbreviation "c.c."

DR. REICHEL: I should like to hear from Dr. Eichhorn as to the exact nature of the "filtrate" because of the direct reference to the work of Bull and Pritchett in the development of a so-called gas gangrene antitoxin. The two final products have nothing in common as the latter is distinctly an antitoxin in the preparation of which the serum of a hyperimmunized animal is used. The question is asked so that a better understanding may be had as to the exact nature of the more recently developed blackleg products.

In regard to liquid blackleg vaccine, it may be stated that the product includes the blackleg bacillus in pure culture and all of the by-products—toxins. In the preparation of the liquid vaccine the blackleg bacillus loses its virulence rapidly while its growth in the culture media is accompanied by the production of toxins which in themselves have immunizing value. The presence of the blackleg bacilli are of value in the production of an antibacterial immunity along with the antitoxic, which should be taken into account, particularly so in the protective immunization of cattle on highly infected premises.

DR. RECORDS: I would like to ask Dr. Goss a direct question in this matter. He speaks of a large percentage, I think it is fifty per cent, of recoveries from the use of serum. I would like to hear just what he calls a recovery. It would seem that the destruction of tissue in this disease is so great that even though the animal's life was saved, it would be permanently ruined so far as any economic value went.

DR. REICHEL: It has been my experience in injecting calves with blackleg muscle virus that should the calf withstand infection, the virus at the site of injection is likely to become encapsulated and the encysted material will include highly virulent virus for many months.

DR. GOSS: Following the large doses of blackleg virus there are quite a number of the calves which develop blackleg lesions and recover. The susceptibility of calves varies. Sometimes only one out of fifteen inoculated would die of blackleg. At another time twelve out of fifteen died. Nearly all of the calves which do not die develop abscesses which contain blackleg organisms.

DR. RECORDS: Maybe I misinterpreted your remark. I thought you referred to the use of serum as a curative agent in well developed clinical cases. It was the outcome of such treatments I was interested in.

DR. GOSS: The material which produces the immunity is an antitoxin. I think that the toxin is responsible for the symptoms. If the serum is administered early, it will neutralize a large amount of toxin and recovery will result in a large number of cases. I

cannot say whether abscesses form in this case or not, as I have no information upon that. However, there may be someone here who knows.

DR. CONNAWAY: I would like to say a word in behalf of the old powder form of blackleg vaccine, as prepared by the Bureau of Animal Industry at the Washington laboratory. We have had very few complaints in Missouri that would lead us to think that the death of calves following vaccination was due to the vaccine. I think that most of the unsatisfactory results may have been due to filtering out too much of the vaccine powders, after trituration and mixing with sterile water. When this occurs, the operator injects but little of the original vaccine, and the calf is not protected. To avoid this fault, our advice for some time has been to *not* filter the vaccine, after its thorough trituration and mixing with sterile water. The filtration is to prevent clogging the hypodermic needle; but there is no danger of this occurring, if the directions for mixing are carefully followed. Nor is there any danger of giving an overdose of vaccine by omitting the filtration.

The bacteriologists and immunologists present will recognize that these new biological products—the unheated "blackleg filtrates"—are not anything new at all, except possibly in the technique of preparation. The immunizing substances of these "filtrates" are the same things that exist in the Government vaccine powders, and there is no particular advantage in using these new preparations unless there is a real danger from virulent living organisms in the powder vaccine. This danger, I am sure, is not great with the Government vaccine. The substance that stimulates immunity is the specific toxin, which is elaborated by the blackleg germs—*B. Chauvaei.* Dr. Eichhorn mentions that in the absence of the vegetative blackleg germs and spores, that produce these toxins, the "toxic filtrates" will stimulate an active immunity, or in an overdose may cause death. These blackleg toxins (as well as the spores) are quite resistant to heat, and perhaps should be credited with no small degree of the specific antigenic power of the so-called "spore vaccine" prepared from blackleg muscle. The ground up, heat attenuated, blackleg tissues may indeed contain as much "active toxin" in an immunizing dose, as these unheated, but well diluted, blackleg filtrates which we are discussing. On the other hand, we should not overlook the possibility that these supposedly "germ-free" filtrates which we are asked to substitute for the old blackleg powder vaccine are, in fact, attenuated spore vaccines, attenuated in virulence by dilution and filtration; that is, by the removal of nearly all, but not all, the living spores. Thus so lessening the *number* that the protective agencies of the animal body are able to withstand their pathogenic activity. It is not discrediting Dr. Eichhorn's technique to say that there is no perfect filter, and that in the pressure of commer-

cial work, some spores are liable to go through the filters, and increase the antigenic properties of the filtrates to a helpful degree; but if the greatest care is not exercised, a sufficient number will pass to develop into a dangerous product. So, after all, I think there is but little difference between these new products and the old-time vaccine, so far as the active immunity producing substances are concerned. I would therefore caution the practicing veterinarians not to discard old and good ways, until fully assured that the new are essentially better. I wish to add this advice to that which Dr. Giltner has given you. I am sure that neither of us has the least desire to obstruct real progress along these lines.

In the matter of the serum treatment, referred to by Dr. Goss, I regard this, while not wholly new, as a distinctly helpful addition to our therapeutic means. This, as you know, is a "passive" antitoxic treatment useful in saving infected animals.

DR. EICHHORN: I am very sorry that Dr. Giltner in his initial statement made the remark that he knows nothing about blackleg, as otherwise he would not have taken such a determined stand against the new products. With regard to blackleg filtrate, there is nothing new about it. In Japan it has been used for several years and the reports on the same as furnished me by Professor Nitta are uniformly satisfactory. In my paper I gave the fundamental principles on which the action of this product is dependent, and also the experimental results with this product in the laboratory and in the field. His warning against the use of the new products is uncalled for since it is recognized that the old form of vaccination has not given general satisfaction, and furthermore the tests with blackleg filtrate have conclusively shown its immunizing qualities. Besides the fact that the United States Bureau of Animal Industry has granted a license for the preparation of this product should have been considered by Dr. Giltner. Unless a product possesses the qualities which are claimed for it a license could not be granted for its manufacture.

With regard to Dr. Reichel's remark, I believe he has not carefully read the paper to which I have made references. I stated that the toxins as developed by Bull and Pritchett with the organism of gas gangrene when injected into rabbits and other animals produced a serum possessing immunizing and curative properties. In their work they established the necessity of placing meat into the media and that without such an addition they were unable to produce satisfactory toxins. The work which I carried out with blackleg filtrate proved conclusively on comparative tests with media containing meat and media not containing meat that in order to produce active toxins addition of the meat is necessary. It is possible to produce limited and somewhat inactive toxins without the addition of the meat but toxins which will kill animals

in limited quantities cannot be produced in such a manner. I desired to bring out these facts in my paper which have been supported by extensive experimental work.

I believe Dr. Reichel asked me what is contained in the filtrate and whether the specific substances are artificial aggressins. I think that the use of the term aggressins in this instance is a misnomer. The products described as natural aggressins in connection with a new blackleg vaccine are produced from the tissues of infected animals and contain without a doubt besides the aggressins the various specific toxins. The work which I carried out with the filtrates proved also that the action is dependent on the specific toxins they contain. The injection of these toxins into test animals showed that they are capable of producing typical blackleg lesions with the gas formation which indicates that the pathological processes which develop in the course of the disease are due to the action of the toxins and not the germ proper.

With regard to Dr. Connaway's statement, I do not understand how he can claim that the new products are simply the old ones in different form. Everyone knows that in the production of the pellet and powder vaccine the virus is heated for five hours at 96°C. which naturally would destroy all the toxins and other products and leave only the attenuated spores. On the other hand in the preparation of the filtrate the germs are entirely eliminated and the action of the product results from toxins which it contains. In order to preserve the toxins in the product, heating it must be avoided since the toxins are destroyed by the action of higher temperatures.

—Dr. C. C. Walch, formerly at South St. Joseph, Mo., is now Inspector in Charge at the Schalker Packing Co., Leavenworth, Kans.

—Dr. Lester H. Howard has been reappointed Commissioner of Animal Industry for Massachusetts for three years. Dr. Howard's ability and numerous testimonials from all portions of the state indicate the esteem in which he is held.

—Captain J. E. Hanna, A.V.C., has been awarded the Military Cross. Captain Hanna is a Canadian, a graduate of the Toronto College, and is the first Canadian veterinary officer to receive this honor.—*Veterinary Journal.*

—The marriage of Miss Mary Angeline Finney and Dr. Gary T. Stone occurred at Binghamton, N. Y., January 12, 1918.

THE PRINCIPLES OF OSTEOPATHY AS APPLIED IN THE TREATMENT OF VETERINARY PATIENTS*

E. A. A. GRANGE, Toronto, Canada

Since the days of Hippocrates, and even before his time, many theories regarding the cure of disease have been advanced by deep thinkers and talented men, and accepted by the public until some of them became as fashionable as the cut of a man's coat or the style of a woman's bonnet and those which proved themselves of real practical value held their own and have remained in force until the present time. Much of that which had been advanced regarding the cure of various maladies led to a careful study of the manner in which disease is believed to be cured and the question soon became of paramount importance in science. There arose, with others, the allopathic mode of cure, which teaches that a disease is cured by producing another disease which though in itself unnatural overcomes the existing disorder. This method seems to be one of Nature's favorite means for combating certain disorders. Through the bowels, for example, spontaneous diarrhea often relieves internal congestion and through the skin copious perspiration, febrile attacks. In a similar manner blisters relieve pleurisy, purgatives alleviate local inflammation, and diuretics remove edema or dropsy. Indeed the term allopathy means when somewhat liberally translated "another disease."

Then we have the antipathic mode of cure, an ancient and time-honored line of treatment which has for its object the production of a disease which is diametrically opposed to the one existing, but at the same time is a manageable disorder which soon wears itself out and in the meantime the cause of the primary disease is removed, thus purgatives remove constipation; and in some animals emetics remove offending objects from the stomach. There are other time honored pathies or modes of cure, but time will hardly permit me to even mention them, as I wish to direct your attention for a few moments to the subject of my talk, viz: osteopathy, but I wish it to be clearly understood, that I do not intend to discuss it, or extoll it, at the expense of other methods of treatment which have stood the test in curing disease for generations past; they are all good if judiciously applied.

*Presented at the 54th annual meeting of the American Veterinary Medical Association, Kansas City, Mo., August 1917.

It may now be asked what is osteopathy? My information leads me to believe that in the early days of the Art and Science, much attention was given to the skeleton and proper adjustment of the bones forming it, so that may account for the term. Modern students and advocates of the science go far beyond the bones and include various organized tissues. They further say, the science of osteopathy depends for its success in the application of an art which demands a most thorough knowledge of anatomy and physiology as well as other sciences relating to the welfare of mankind. In order that this knowledge may be gained by those desiring it, colleges maintaining a curriculum which embraces the teaching of 23 different subjects including bacteriology as well as many others, usually found in the curriculum of an ordinary medical college, and to complete the course require 4000 hours or more of regular class work. An institute for research in osteopathy has also been established in Chicago. I am informed that one of the chief methods adopted in the art of osteopathy, for the cure of disease, consists in first determining where the nerves and blood vessels originate which supply the injured part, and after it has been adjusted as far as possible by mechanical means the nerves and blood vessels are manipulated so as to increase their action and function and through the extra supply of blood to the part the injury is repaired. The effete matter may then be carried away by the lymphatics. To accomplish the foregoing successfully requires a most accurate knowledge of anatomy which in itself is to be highly commended. Then the successful practitioner must have a delicate sense of touch in order that he may readily detect malformation or misplaced objects; the latter is largely acquired by the examination of patients. One practitioner told me that his sense of touch had become so acute that it was almost marvelous, which is another thing to be commended in veterinary practice, especially in examining horses for lameness. In this connection I can remember in my student days one of our professors advising his classes to wear a glove in order to improve the sense of touch.

There are many other things besides those I have mentioned which are required to complete the education of an osteopathic practitioner, but they are to be found in the twenty-three (23) subjects taught in the colleges, and not necessary to mention here.

It is not claimed that osteopathy is a cure-all, as writers upon the subject admit, there are disorders that are incurable; there

are diseases which need surgical attention; an anesthetic is a necessity; a parasite requires an antiseptic; a poison demands an antidote and so on.

In following the question from a veterinary standpoint the literature of the Art and Science informs us that goiter can be cured in dogs by osteopathic methods. For this purpose nine dogs having goiter were treated without medicine. All showed reduction in the size of the thyroid gland, some of the cases reaching the normal. Two dogs which were kept as controls, under the same hygienic conditions, did not show improvement. On another occasion a number of monkeys were imported from tropical climates. All but one of them were affected with a disease which subsequently showed evidence of being caused by animal parasites. Two of the animals died before the cause of the disease was discovered.

Fourteen of the monkeys were treated by osteopathic methods and of these ten recovered and four died. The ten lived, grew larger and stronger until it was thought the disease was permanently cured.

The literature of the science describes many cases in which the line of treatment had a beneficial effect in small animals, but nothing has been done, as far as I am aware, by way of experiment or treatment in horses or cattle.

Among other things relating to the cure of diseases, osteopathic research workers state that they have demonstrated a marked increase in the phagocytes of the blood by mechanical manipulation. If this can be demonstrated by veterinarians in the blood of cattle and horses it will surely be a wholesome stride in the treatment of some diseases in our patients, the value of which is difficult to estimate. In adopting any new line of treatment it is perhaps unfortunate that the veterinarian is often handicapped by the intrinsic value of his patient, but notwithstanding there may be a good many cases where this comparatively new line of treatment would meet the circumstances.

I have recently been informed that in certain cases of cataract in the human patient a great deal can be done by manipulation in effectively warding off the disease; this suggests a trial of mechanical manipulation in staying or warding off that progressive disease which we call periodic opthalmia. The literature of the question suggests others which might be profitably dealt with when some other mode of cure does not accomplish its object.

If the principles of the science can be demonstrated as being beneficial and economical in the treatment of the diseases of horses and cattle, it will indicate that before the list of veterinary pathies or modes of cure are complete osteopathy will need to be given a place.

If in the foregoing fragmentary sketch of an important question I have said anything, to those who have not already studied it, which may furnish food for thought something further may be accomplished; but you will remember that when we leave this hospitable city and state we will all be men from Missouri, and you know what that means.

Discussion

Dr. ———: How would you go about treating periodic ophthalmia by osteopathy?

Dr. Grange: I would first study the anatomy of the parts. I would examine the nerves and sources of supply; then I would find that the originator of this science advocated a limited amount of palpation of the cornea. He does that, in the slight reading I made of the subject, to prevent adhesions, and he claims there is a very positive result as far as the cure of the disease of cataract is concerned.

Dr. ———: Then the treatment of periodic ophthalmia by the osteopathic method is tapping the cornea with the finger or some suitable instrument?

Dr. Grange: Examine the parts and manipulate the blood vessels and nerves which supply the part affected, and if they are manipulated the idea is they are stimulated both in their actions and functions thereby; that means there is an extra amount of blood brought in the part, and somebody told me blood was the principal agent used for curing disease. That various objects were removed and new material was brought in by the blood.

Dr. Arzberger: I had a little experience in the treatment of osteopathy, and will cite a case. A friend of mine, Dr. Godard, in my city, is an osteopath. I had a peculiar case in a bitch of complete paralysis of the hind limb, due to some form of injury of the spine. I was treating her along the general line of strychnine and potassium iodide, and had given that treatment some four to six weeks without any result whatever. Dr. Godard came in my office one day and said: "what have you got here?" I said, "a bitch with paralysis. She has had it three months." I told him of the treatment I had given her. He said, "let me examine this animal." He examined her spine and found two displacements in the lumbar region. After he had demonstrated to me I could find them myself. He told me the simplest form of procedure

for cases of that kind is extension of the vertebrae. He said, "you take this bitch and get her by the back of the neck and hold her up, suspend her there and give her a slight swaying motion and the weight of the animal will gradually straighten the vertebral column." I did that once or twice a day at first and then every other day, and I must say in two weeks this bitch began to walk and she is up and around and raised a litter of pups.

PUBLIC HEALTH STUDIES CONCERNING CHEESE*

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The common meaning of the word cheese is an article of food of which the main ingredient is the more or less modified, coagulated casein of milk. From the sanitarian's point of view this definition could be amplified by adding that, among articles of food obtained from animals, cheese is one of the few which are customarily eaten uncooked.

Uncooked food from animals may contain, varying with its character, composition, mode of preparation, age, etc., many different kinds of organisms and the products of their growth and multiplication, and though most of the organisms and their products which occur in cheese may be swallowed with impunity, some with real or conjectured beneficial effects, a few have been proved to be injurious to health, and even fatally dangerous. As, for example, fresh cheese may be contaminated with virulent typhoid and tubercle bacilli, and relative to bacteria, not strictly pathogenic, but dangerous because of their products, the following statement may prove both interesting and instructive: the Division of Pathology of the Federal Bureau of Animal Industry has a strain of the *Bacillus botulinus* among its cultures of bacteria which produces a toxin of so much potency that a minute quantity, either swallowed with food or injected under the skin, is sufficient to kill a horse. This pernicious microorganism was originally isolated by Dr. Nevin at Albany, N. Y., from a sample of cheese which had killed a number of persons.

Nothing we know about the *Bacillus botulinus,* with which we

*Presented at the Annual Meeting of the International Association of Dairy and Milk Inspectors, October 17, 1917.

are better acquainted through its relation to sausage and meat poisoning, indicates that a combination of extraordinary and rare conditions are necessary to enable it to multiply in cheese that has become contaminated with it. It multiplies in a great variety of nitrogenous substances, both animal and vegetable; it seems to have a fairly wide distribution, and it is now being studied as a possibly important etiological factor in the disease among domestic animals known as forage poisoning. It is a spore-bearing saprophyte which grows best at ordinary, comfortable, room temperature, and seemingly does not multiply in the bodies of live animals because their temperature is too high. Its anaerobic character and the destruction of its toxin by degrees of heat not much greater than those required for the pasteurization of milk, and the fact that most strains produce a less potent toxin than the strain isolated by Dr. Nevin, probably have kept it from becoming a common and important danger in cheese.

Theoretically, all the contaminations which are to be feared in milk, plus those which enter subsequently in the course of manufacture, are dangerous in cheese. Practically this may be true of fresh, soft cheeses, which are eaten shortly after they are made, but not of the kinds which require some time to ripen, because pathogenic bacteria which retain their virulence in milk longer than it can be kept without decomposing, and which may live months in a bland, inert, stable substance like butter, die rapidly in cheese, and processes of decomposition, which may be associated with the formation of poisons in their earlier stages, usually reach final stages before cheese which requires some time to ripen is marketed, and it is generally recognized that the final or end products of decomposition, no matter how offensive they may be, are rarely dangerous. If this was not true we may be sure that those, whose tongues and noses have been educated to enjoy cheese flavors which are far from pleasant to untrained organs of sense and smell, would not have survived the education.

The primary and special purposes of our studies on cheese were to determine the frequency with which it is contaminated with virulent tubercle bacilli at the time it reaches the consumer; the type of the tubercle bacilli, human or bovine, with which it is contaminated, and the length of time tubercle bacilli remain alive and virulent in it.

The tubercle bacillus is an exceptionally satisfactory organ-

ism to use for observation when it is desired to gain a general idea about the fate of true, non-sporulating, pathogenic bacteria in a complex medium like cheese. Its peculiar staining qualities, its somewhat greater resistance than that of other non-sporulating, pathogenic bacteria to germicidal agents; the characteristic lesions it causes in experiment animals, and the certainty with which the tuberculous character of the lesions it causes can be verified, collectively facilitate the ease with which we can detect it and remain on its trail, and these advantages over other bacteria are offset in their favor only by the fact that it does not multiply saprophytically, like the typhoid bacillus, for example, in milk or the fluid from which cheese is made.

A study of the frequency with which cheese is infected with tubercle bacilli, to be sure, can throw no light on the frequency with which it is infected with other dangerous bacteria, but the fate of the tubercle bacillus in cheese may be accepted as an index of the fate of other non-sporulating bacteria, and sporulating bacteria which actually serve as etiological factors of disease have not proved of sufficient importance in dairy products to make their consideration in this connection urgently necessary.

The number of samples of cheese in our investigations on which the tests are now complete is 256, and among these 19, or 7.42%, were found to be infected with virulent tubercle bacilli. The bacilli in all cases were of the bovine type.

The varieties of cheese tested and the number of samples of each, all purchased under ordinary market conditions from Washington, D. C., retail dealers, are as follows:

Cheddar	59	samples—none infected
Miscellaneous varieties	3	samples—none infected
Neufchatel	32	samples—none infected
Cottage	31	samples— 1 infected
Cream	131	samples—18 infected
Total	256	samples—19 infected

If we divide the samples tested into two groups, the fresh and those which require some time to ripen, it becomes apparent at once that the infected condition is invariably chargeable to the fresh cheeses. That this is precisely what we should expect is proved by results obtained with cheese made from intentionally infected milk and periodically tested relative to the persistence of

virulent tubercle bacilli in it, and also by invariably negative results with second tests, about 60 days after the first tests, with the 19 samples of naturally infected cheese.

The cheese specially prepared to study how long tubercle bacilli remain virulent in cheese was made from whole milk, artificially infected in the following manner: a tuberculous lymph gland from a guinea pig was crushed and ground in a sterile mortar with a small amount of sterile normal salt solution and the resulting, turbid fluid filtered through a single layer of ordinary filter paper. A small quantity of the filtrate, which had a slightly milky appearance, was added to the milk, which was then thoroughly stirred to distribute the infected material as evenly as possible. As far as we were able to determine the milk was about as heavily infected with tubercle bacilli as milk obtained from a tuberculous cow with barely discoverable tuberculous lesions of the udder.

The advantage of using a suspension made with tuberculous tissue instead of one made with tubercle bacilli from a pure culture, lies in the fact that the bacilli in tissue suspensions are evenly distributed and well separated from each other, or in the condition in which they occur in naturally infected milk, while in pure culture suspensions it is practically impossible to get them well separated, or to eliminate clumps composed of enormous numbers of bacilli glued firmly together.

Guinea pigs were inoculated with portions of the infected cheese on the 1st, 8th, 15th, 23rd, 39th, 50th, 72nd, 99th and 114th days after it was made. The guinea pigs inoculated on all days from the 1st to the 39th, inclusive, developed generalized tuberculosis; those inoculated on and after the 50th day remained well, showing conclusively that the tubercle bacilli in the cheese had lost their virulence sometime between the 39th and 50th days.

Regarding second tests with naturally infected samples of cheese, our method was as follows: as soon as a sample was received a portion was removed for the first test and the balance placed on ice. If the first test, which required from 50 to 60 days, was negative, the balance of the sample was discarded; but if the first test caused tuberculosis, a second test was at once made.

An interesting difference between the first and second tests with the 19 samples of infected cheese is revealed by comparing the morbidity and mortality among the guinea pigs used, respect-

ively, in the first and second tests, and dependent upon other causes than tubercle bacilli. But, before making this comparison, we wish to say a few words about cheese inoculations into guinea pigs generally.

When we take small quantities of cheese and triturate them with sterile, distilled water and inject the consequent suspension or emulsion subcutaneously into a guinea pig, the results may range in severity from a small, local lesion to death in less than 24 hours. If the cheese is one of the kind which are eaten shortly after they are made, cream, cottage or Neufchatel, most of the inoculated guinea pigs die very quickly of septic intoxication, septicemia, malignant edema or some similar cause. Those which do not die within a few days develop lesions which vary in size and character from minute pus pockets at the seat of inoculation to enormous abscesses which eventually break through the skin and discharge their often purulent and ill-smelling contents. If the cheese is one of the kind which require some time to ripen, Cheddar, for example, the death rate is relatively low and the inoculation lesions are relatively small and benign.

Now, the difference between the earlier and later, the first and second inoculations, made with the 19 samples of infected cheese, is similar to that between inoculations with fresh cheeses and those which require some time to ripen.

Some of the samples of infected cream cheese which had been kept until they were converted into filthy looking, gelatinous masses, no longer recognizable as cheese, on inoculation into guinea pigs were practically harmless, which indicates that the prevailing belief, that the end products of decomposition are not commonly dangerous, is trustworthy; and, in addition to this, strengthens the reasons we have for believing that the fate of septicemia and pus-producing bacteria in cheese is similar to that of the tubercle bacillus, and this, in turn, supports our conviction that we are not going astray if we accept the fate of the tubercle bacillus in cheese as an index of the fate of other, non-sporulating, pathogenic bacteria in the same medium.

The best method with which we are acquainted to test dairy products for tubercle bacilli is guinea pig inoculation, and the statements we have made, regarding the consequences when guinea pigs are injected with suspensions of cheese in sterile water, show that it is essential, if we desire to test a large number of samples

of cheese for tubercle bacilli without sacrificing too many guinea pigs or causing the little animals too much serious discomfort and pain, to use a special technique, which will suppress various micro-organisms that are injurious when they enter the bodies of guinea pigs through the skin though they may be swallowed by persons with practically no danger, and it is in this connection that the greater resistance of the tubercle bacillus to germicidal agents serves a good purpose.

After numerous tests regarding the effects of different agents on cheese, and on tubercle bacilli, and on tubercle bacilli in cheese, the following simple technique was adopted.

Thirty grams of cheese are thoroughly triturated with a freshly made, 2%, aqueous solution of sodium hydrate. Of the solution 170 c.c. are used for a soft and double the quantity for a hard cheese. The solution is added slowly while the cheese is being triturated in a beaker held partly immersed in warm water, so as to maintain a temperature of from 35 to 40°C. The warmth helps to dissolve the cheese and tends to melt and keep the fat it contains fluid. This process requires about 20 minutes and yields a homogeneous, turbid fluid, which is placed in centrifuge tubes and rotated 10 minutes at 2500 revolutions per minute. The tubes are then taken from the centrifuge and all but the sediment discarded. If the amount of sediment is small it is simply suspended in a small quantity of sterile, distilled water and injected, subcutaneously, into two guinea pigs. If it is large it is suspended in a larger quantity of sterile water, thoroughly shaken, and again centrifuged to get rid of the sodium hydrate it may contain in quantities too large to be safely injected into the subcutaneous tissues of guinea pigs. The fluid from the second centrifuging is discarded and the sediment, as in the case where the amount is small, suspended in sterile, distilled water and injected into two guinea pigs.

Among the other methods tried before we adopted this simple technique, one, in which antiformin was used instead of sodium hydrate, gave fairly good results, but was abandoned because of the degree to which antiformin varies in strength from time to time and the ease with which a fresh solution of sodium hydrate of definitely known strength can be made.

The danger from using a solution either of antiformin or sodium hydrate of unknown strength lies less in the direction of too much than too little strength. Though we decided to use a 2% so-

lution of sodium hydrate, we know, from actual tests, on the one hand, that a 1% solution, which is permitted to act 30 minutes, is strong enough in many cases to make the sediment from samples of cheese safe, so far as other microorganisms than tubercle bacilli are concerned, for guinea pig injection, and, on the other hand, that the exposure of tubercle bacilli in cheese to a 5% solution of sodium hydrate for 30 minutes is not sufficient to kill them. We might add, we have also found some samples of cheese the sediment of which, after an hour's exposure to a 10% solution of sodium hydrate, kills guinea pigs injected with it in 48 hours or less. Deaths in this case are due to malignant edema, the microorganism of which is harmless when it enters the body through ingestion.

Our simple technique has been defined in some detail because it is eminently desirable that samples of cheese purchased elsewhere than on the market immediately within our reach should be tested for tubercle bacilli, and because it is hoped that some of those now present may have the will and facilities to make such tests.

The amount of sediment obtained from samples of hard cheese, or the kind which requires some time to ripen, as a rule, is doubly as voluminous as that from samples of soft, fresh cheese; hence, the fact that guinea pigs injected with the more abundant sediment from carefully weighed masses of hard cheese rarely die or have serious, local, injection lesions, while those injected with the less abundant sediment from equally heavy masses of soft, fresh cheese show a fairly high mortality, is worth recording, as it gives us another proof that the wholesomeness of cheese, as far as this is affected by pathogenic bacteria, improves with age.

The sediment obtained from every sample of cheese included in our tests was examined both macroscopically and microscopically; the examinations revealed many different kinds of bacteria, fungi, mycelium, pollen grains, seeds, fragments of vegetable matter and more or less amorphous material. Nearly every sediment contained a greater or lesser amount of black substance which had the appearance of lampblack or fine coal dust; in many cases fragments of wood and minute shreds of cloth were found; in a lesser number fragments of flies and other insects; in a few the wing cases of beetles, and in one case mouse feces. The practical conclusion to be drawn from these examinations is that greatly varying degrees of care and cleanliness are practiced in different cheese factories, and that great improvement in this respect is possible in some of them.

Bacteria, other than pathogenic organisms, and cheese, are inseparable; an occasional fragment of wood or shred of cotton cloth should reasonably be expected in cheese, but fragments of insects, wing-cases of beetles and mouse feces are not pardonable or tolerable contaminations in any article of human food.

That official supervision of cheese factories may effect much good is casually indicated by our work. When it became known that cheese currently sold by retail dealers at Washington, D. C., was contaminated with virulent tubercle bacilli, the Federal Bureau of Animal Industry, through its Dairy Division, immediately undertook measures to correct the evil. The measures in question, together with the moral influence of the interest shown by a great bureau of the Government, as nearly as we could calculate, became effective about the first part of April of this year. The accuracy of our calculation as to the time was later confirmed through consultation with members of the Bureau's Dairy Division staff. Now, beginning April 3, 1917, we periodically purchased samples of cheese of the variety which had been found to be contaminated with tubercle bacilli. The total number of samples purchased on which our records are complete is 33, and from these 66 guinea pigs were injected. Among the 66 guinea pigs only 2 premature deaths followed the injections. In contrast to this, 20, or ten times as many, premature deaths occurred among the 66 guinea pigs injected from the last 33 samples of the same variety of cheese purchased and tested prior to April 1, 1917.

We must not erroneously assume that the proportion of premature deaths among cheese-injected guinea pigs is a reliable measure of the presence or absence of factors which perniciously affect human health, but we may reasonably assume that, as the proportion of premature deaths increases, the likelier it is that the cheese in question was manufactured under conditions which facilitate the introduction of contaminations of all kinds, including those which are injurious to health.

We must now return for a moment to the statement regarding the varieties of cheese tested and the number of samples of each found to be infected with tubercle bacilli, because there is one point which merits special attention.

Leaving the samples of cheese of the varieties that require some time to ripen before they are marketed out of consideration, none of which were found to be contaminated with tubercle bacilli,

we have 194 samples of fresh cheese, which may be divided as follows:

131 samples of cream, 18 or 13¾%, infected with tubercle bacilli.
31 samples of cottage, 1 or 3¼%, infected with tubercle bacilli.
32 samples of Neufchatel, all free from infection.

The samples of cream cheese included 9 which were marked "Pasteurized", and among these not one was infected; hence, we may subtract them from the 131 samples, which leaves 122, of which 18, or 14¾%, were infected with virulent tubercle bacilli.

If we take the 32 samples of Neufchatel and 31 of cottage cheese and add them together, it gives us 63 samples of which only one, or 1½%, was infected.

The pertinent question suggested by these figures, and which we have already been asked to answer, is this: "If one variety of soft, fresh cheese is so frequently infected with virulent tubercle bacilli, why is it that other varieties, which are marketed just as early after they are made, are so rarely infected?"

We admit, as there are no reasons for believing that some varieties of cheese are currently made from cleaner and better milk, or under cleaner and better conditions, than other varieties, that the difference in the frequency with which different varieties of soft, fresh cheese are shown by our work to be contaminated with virulent tubercle bacilli is at first a little puzzling. But you will probably find the following explanation for the difference both simple and convincing.

Cream cheese, or the variety among which 14¾% of infected samples were found, to judge from the amount of butter fat our tests showed it to contain, is made from whole milk with the addition of some cream.

The cottage and Neufchatel cheeses examined, on the contrary, with a few exceptions among our samples, were made of skim milk; and, to judge from the amount of fat obtained in our centrifuge tubes, it was pretty thoroughly skimmed milk.

Now, when milk is centrifugalized, or only permitted to stand undisturbed until the cream has risen to its top, it separates into three distinct layers, cream, skim milk and sediment. If the milk is infected with tubercle bacilli and we make microscopic examinations of the three layers, we find that the bacilli have left the mid-

dle layer or the skim milk and have become concentrated in the cream and sediment. Hence, cream cheese contains all the tubercle bacilli which may be present in the whole milk from which it is made plus those which may have been concentrated in the added cream from other milk, while cottage and skim milk Neufchatel cheeses, at most, contain only the greatly reduced number of tubercle bacilli which may, somehow, have been reintroduced from the cream and sediment into the skim milk of which they are made. The sediment here referred to is the equivalent of centrifugal slime in cream separators.

In the one case we have skim milk, cream, sediment and added cream, and in the other milk less the cream and sediment, which clearly justifies the conclusion that, while tubercle bacilli may be a common contamination in cream cheese, they should be of rare occurrence in cottage and skim milk Neufchatel cheeses, and this is precisely what our tests show to be the case. We may say regarding the one sample of infected cottage cheese included in our tests that it was evidently made with milk obtained from a dairy herd in which some cows are far advanced cases of tuberculosis, and, most likely, one or more have tuberculous udder lesions.

In a precautionary sense we wish to say, the tendency of tubercle bacilli in milk to rise with the cream and to sink with the sediment and to pass from the intermediate layer or the skim milk must not be taken too hastily as an argument to prove that skim milk is a germ-free fluid. The conduct of the tubercle bacillus in milk may be wholly unlike that of other bacteria, and this must be apparent at once to those who keep in mind that the movements of bacteria in an emulsion or other fluid may be greatly influenced by their lack or possession of independent motility. It is questionable, even if it should prove possible to eliminate tubercle bacilli entirely from skim milk through centrifugal processes, whether the same could be done with more or less actively motile bacteria, such as the members of the so-called colon group, which includes typhoid, paratyphoid, enteritides and other dangerous bacilli, most of which, unlike the tubercle bacillus, multiply in milk.

But, though we would like to say much more on this subject, we do not wish to impose too much on your patience, and therefore will trouble you now only long enough to listen to several conclusions which our studies seem to warrant.

1st. We may safely say, and we say it with great satisfaction, that cheese of the kind which requires some time to ripen rarely if ever contains true, living, pathogenic bacteria when it is marketed, and it does not seem likely that such cheese is apt to contain dangerous products of bacterial origin.

2nd. Cream cheese, which is an elegant, palatable, nutritious article, recommended by many physicians as excellent food for children and invalids, until quite recently was heavily contaminated with tubercle bacilli of the bovine type, or tubercle bacilli of the kind which have their origin in the bodies of tuberculous cattle.

That children are attacked by bovine tubercle bacilli is now an undisputed fact, which no one acquainted with the evidence on which it rests seeks to controvert. That invalids are more liable than healthy persons to be attacked by disease germs is a matter of common and reasonable belief. It would be a great pity if we should have to advocate the withdrawal of cream cheese from the list of foods particularly valuable for children and invalids; hence, we should strive to have all cream cheese made, either from pasteurized milk and cream or from milk and cream obtained from cows which have been proved free from tuberculosis.

The proper pasteurization of the milk and cream used in making cream cheese would accomplish something more than the elimination of virulent tubercle bacilli; it would also destroy dangerous germs of the colon and septicemia groups, which are not at all uncommon in milk, and the presence of which in food no sanitarian can view without alarm.

3rd. Cottage and skim milk Neufchatel cheeses, which could reasonably be used much more commonly than is now the case, and the commoner use of which is now urgently desirable as a food conservative measure, are much less frequently infected with tubercle bacilli than cream cheese. But this should not be used as a reason for making them from raw milk. The facts that they are at times contaminated with tubercle bacilli and that the centrifuge or cream separator, which tends to eliminate tubercle bacilli from skim milk, cannot be taken, off hand, as doing the same thing with the dangerous germs of the colon group, or the bacteria which have independent motility, are sufficient reasons to make it desirable that all milk used in the manufacture of cottage and Neufchatel, and all other varieties of fresh cheese, should be pasteurized. One

might ask here: Why temporize with disease germs in dairy products when we can pasteurize and kill them?

4th. The foreign matter discovered in some samples of cheese prove that more cleanly methods of production from the cow to the finished product are desirable. With this we do not wish to condemn all cheese factories as unclean, because this would be a serious and unjust mistake, as not all the samples of cheese we examined, or even a large proportion, revealed contaminations which are directly chargeable to carelessness and lack of proper cleanliness.

Official supervision of cheese factories probably would eliminate fragments of flies and various insects from cheese, as well as other equally unappetizing contaminations.

And 5th. It seems to us as a whole, that cheese, so far as disease germs are concerned, with the possible exception of cream cheese, is a fairly safe article of food; and, regarding cream cheese, it is our intention to make frequent, periodic tests, and to base such action on the conditions shown by these tests, that we will soon be able to say that this article of food, excellent alike for the weak and the strong, the healthy and the sick, and for children and adults, is safe.

—Dr. C. M. McFarland, for some years in the government service, has resigned his position as Inspector in Charge of the Serum Inspection Service, Bureau of Animal Industry, at Sioux City, Ia., to become associated with the Purity Biological Laboratories of the same city, as Assistant Manager.

—Dr. S. F. Tolmie of Victoria, for many years Chief Dominion Veterinary Inspector and Live Stock Commissioner for British Columbia, has been elected to the Dominion or Federal Parliament. Dr. Tolmie ran on the Unionist ticket and defeated his opponent in the ratio of 4 to 1.

—Dr. Lee A. Wilson has removed from Taylors Falls, Minn., to Omaha, Neb.

—Dr. S. E. Springer has removed from Omaha, Neb., to New Orleans, La.

—Dr. G. H. Acres has been reelected Mayor of Grand Forks, B. C., by acclamation.

DAIRY INSPECTION*

W. H. Bailey, D.V.M.
City Dairy Inspector, Instructor St. Joseph Veterinary College

Authorities in public health work recognize that milk is by far the most important food with which public health officials have to deal.

As a food for infants, children and invalids it is one of the most valuable of foods. It is especially subject to virulent bacterial contamination and chemical deterioration.

There are also economic problems in connection with milk and milk food products, but they are far less important than those of hygienic nature. High cost of dairy supplies is no just excuse for careless and indifferent methods which lead to an unsafe milk supply.

Numerous researches as to the necessity for, and the ways and means of clean milk production have been amply confirmed by the successful application of proper methods in milk production and handling. The most serious danger in milk as a menace to health, is simply pathogenic contamination. Milk being a product of animal metabolism, containing in its makeup highly nutritious and complex organic substances, of which protein is a very important part, and possessing a temperature incident with body heat, it constitutes a very favorable culture media for microorganic life.

Exclusive of udder infections, bacterial contamination of milk is chiefly exogenic in origin. Mother Nature guarded against exogenic contamination by providing a very short route from producer to consumer. Man, however, interceded with Nature's plans, and appropriated at first only that amount of milk necessary for his own immediate family consumption. Later, however, with the rapid growth and development of cities, he commercialized the product and milk production, handling and distribution became a rather complex affair, exposed to almost every condition that might lead to bacterial contamination.

The white opaque appearance of milk has covered a multitude of sins and not until the science of bacteriology developed was the importance of a clean milk supply fully appreciated.

*Presented at the 54th Annual Meeting of the American Veterinary Medical Association, Section on College Faculties and Examining Boards, Kansas City, Mo., August, 1917.

Most cities now have some form of milk hygiene control. In the smaller cities and towns it is often necessary to have a person who is qualified for the position of dairy and milk inspector combined. From a health standpoint, it is essential that dairy and milk inspection be carried out in the numerous communities throughout the nation. What an immense and important field is then open to the veterinary profession.

In order that milk hygiene control may be scientific and therefore efficient, it is highly important that our veterinary colleges provide proper courses in dairy and milk inspection. Nowhere in the curriculum is there more opportunity to impress upon the student's mind the value of animal hygiene than in dairy inspection.

By visiting the dairies of different degree, making an individual study of each and rating the sanitary condition in terms of percentage upon the government score card; the whole work supervised by an instructor in charge, the study becomes entertaining, impressive and of great value to the student.

The instructor may allow each student to score individually after he has received careful instruction in regard to the use of the score card.

A few lectures may be given in the dairy buildings, which serve to freshen the student's mind in regard to details. In the field is the place to teach the student the great importance of ventilation, light and hygienic stable conditions generally.

For instance, once with a party of students, I visited a certain dairy farm. Stable hygiene was the topic for the day. On entering the stable we found a double row of cows facing each other, separated only by a narrow alley. The day was very cold, and this is the picture which I think left a very effective impression upon the students. The snow white exhalations from the cows on one side were inhaled directly by the cows on the opposite side and vice versa. The white exhalations could actually be seen, drawn into the nostrils of the opposite cows.

The herd in this stable had just passed a satisfactory negative tuberculin test. But about this time a cow of questionable history was added to the herd. About five months later this cow was condemned, slaughtered, and tanked, due to generalized tuberculosis. Upon retest 87% of the previously healthy animals were condemned for tuberculosis. The student should receive the full courses in anatomy, physiology, pathology, chemistry and bacteri-

ology, as well as special instruction in dairy bacteriology and chemistry, prior to his field instructions in dairy inspection.

Any community should adopt the three methods—education, inspection and legislation—in order to obtain proper milk hygiene control. These methods must be closely correlated. Education, inspection and legislation should, in my estimation, be carried on at the same time because: education, along the lines of milk hygiene fails to accomplish the desired results as the careless and indifferent class of producers is ever present, while inspection without legal authority and enforcement also fails.

Inspection is generally divided into dairy and milk inspection. Dairy inspection deals with sanitary equipment and methods of the dairy farm, city milk plant and ultimate distribution. Dairy inspection is, therefore, an inspection of gross conditions, things which may be readily appreciated by the five senses without the aid of special apparatus.

Milk inspection proper, on the other hand, is conducted at the laboratory and deals with the determination of the actual hygienic condition of milk itself, exclusive of equipment, methods and environment of milk production.

While the most important methods in safe milk production are well known to this body, still I feel that it would not be out of place to indulge in a brief rehearsal of the cardinal methods, in which the student should receive quite extensive instruction.

I. Healthy Cattle. Tuberculosis, foot-and-mouth disease, anthrax, cowpox, mastitis and milk sickness, are among the diseases which may be transmitted from the cattle to man through milk. Actinomycosis, botryomycosis and rabies are diseases of cattle not commonly transmissible to man through milk, but as a means of safety, milk from cattle affected with the foregoing diseases should be excluded from consumption in the raw state.

Tuberculosis is by far the most important disease, needful of control. 25% to 50% of tuberculosis originating in the cervical and mesenteric glands is of bovine origin (Theodald Smith), 25% to 50% of all tuberculosis in children under 5 years of age is of bovine type (Rosenau). Tubercular contamination of milk may take place principally by: (1) tuberculosis of the udder, (2) tubercular organisms in the animal excreta, gaining entrance to milk by means of droplet or manure dust infection, (3) by tubercular attendants.

Annual tuberculin testing of all dairy herds, immediate isolation, and subsequent slaughter of all reacting animals, also immediate tuberculin testing of all new additions to the herd, along with proper methods in stable hygiene will serve to eradicate the disease and minimize the danger. The work should be conducted by competent and authorized veterinarians.

II. The Importance of Clean Milking Methods. (a) *Clean hands and utensils.* One of the fundamental principles in clean milk production is to handle milk just as little as possible, and to have all apparatus in connection with milk production constructed as simply as possible, with all parts readily accessible to thorough cleansing processes, thereby reducing exposures to contamination; no little attention should be paid to the condition of the cows, attendants, stable floors, milk pails, strainers, coolers and methods of handling milk in the milk room during milking time.

Considerable research has definitely proven that bacterial contamination at the time of actual production is of major importance; that clean milking methods, with sterilized utensils, is the only practical way of producing safe and wholesome milk.

Grotenfield found that freshly drawn milk from filthy cows by filthy methods contained 670,000 bacteria per c.c., while that drawn from clean cows by clean methods contained as low as 100 bacteria per c.c. Russell found freshly drawn milk, which was collected in sterile pails to contain from 300 to 1700 bacteria per c.c. That collected in commonly clean vessels contained from 13,000 to 93,000 per c.c., while in the dirty vessels the count ran from 215,000 to 806,000 per c.c. The milker's hands, and the manner in which he milks, is of great importance. The cow's udders and flanks cannot receive too careful cleansing. The first or "fore" milk should be discarded. Intelligent and interested persons are the only ones who should be entrusted with the important work of milking.

(b) *Efficient Cooling.* Numerous investigators, after careful research, have proven that when milk is cooled and stored until used, at a temperature of 50°F. or lower, very little, if any, multiplication of the original number of bacteria occurs for some 12 hours.

Dr. Park found that freshly drawn milk containing 5000 bacteria per c.c., if kept at 50°F. for 24 hours increased only to 7000, while that kept at 65°F. for 24 hours increased to 280,000, and that kept at 95°F. for 24 hours increased to 12,500,000,000.

Freudenreich found that the bacteria in milk scarcely multiplied if kept at 59°F. for 3 hours, while that kept at 77°F. for 3 hours multiplied 2 times; at 95°F. for 3 hours multiplied 3 times; at 59°F. for 6 hours multiplied 2.7 times; at 77°F. for 6 hours multiplied 18.5 times; at 95°F. for 6 hours multiplied 1300 times.

Such experiments as these prove beyond any doubt the great value and necessity for proper cooling.

(c) *Sterilization of Utensils.* Live steam is very essential, and is to be regarded as one of the major requirements in the line of dairy equipment.

Typhoid and paratyphoid fever, diphtheria, cholera, tuberculosis, septic sore throat and scarlet fever are diseases of man which may be transmitted through contaminated milk. Other bacteria, some of which are responsible in a large measure for the serious intestinal disturbances in the young, may be present at times. Aside from the specific and septic infections, authorities are well agreed that even the so-called non-pathogenic organisms are of no benefit in milk when present in excessive numbers. The conclusion is, therefore, that milk should be produced and handled so as to keep the bacterial contents as low as possible.

Milk pails, properly washed, rinsed and set aside for 10 hours and then rinsed out with sterile water, removed 5,240,000 bacteria. Cans washed with hot water and brush and properly rinsed, set aside for one hour and rinsed with sterile water, removed 4,600,000 bacteria. From a milk can, under the same conditions after 10 hours, 1,400,000,000 bacteria were removed. After 24 hours 2,680,000,000 were removed. The lowest count from a can under the same conditions at the end of 24 hours was 300,000 and the highest was 3,000,000,000. Cans washed in the same way, but treated thoroughly with live steam and rinsed out with sterile water at the end of 24 hours contained only 4,000 bacteria per can. These experiments prove definitely that live steam and plenty of it is highly essential.

(d) *Transportation and Distribution.* The time taken for delivery is of far less importance than the care received previous to and during transportation.

The transportation and distribution of milk (bottled at the dairy) well iced in neat covered wagons, in care of clean, courteous drivers, is all that we might wish for in that line; the main essential being to keep the milk at a continuous temperature of 50 degrees or lower until in the hands of the ultimate consumer.

III. PASTEURIZATION. The holding method of pasteurization is designated to destroy the pathogenicity of organisms which may often gain entrance in milk, which is produced even under the best of conditions.

From abundance of data, pasteurization is to be considered as one of the methods in keeping clean, wholesome milk safe until it reaches the consumer's table. Pasteurization at 145°F. for thirty minutes does not interfere to any extent with the flavor and digestibility of milk which was clean and wholesome in the original state.

As most of the specific pathogenic organisms found in milk are not spore producers, and because of their low thermal death point, proper pasteurization is an efficient method in rendering clean milk safe.

On the other hand, milk which is reeking with hundreds of thousands, even millions or billions of bacteria per c.c. cannot be rendered safe by pasteurization. Such milk should be sterilized. General market milk should not contain on the average more than 150,000 bacteria per c.c., and it should be pasteurized by the holding method. That kind of milk is safe and wholesome, and it is possible to obtain a large amount of it in most any community, and at a reasonable cost.

There are a few interesting points which should be especially impressed upon the student to show him the value of close correlation of dairy and milk inspection.

(a) Milk produced under filthy conditions may possess a low bacterial count if it is instantly and constantly cooled to 50 degrees F or below.

(b) Milk produced under sanitary conditions may possess a high bacterial count at the time of distribution, if it has not been cooled and maintained at proper temperature.

(c) A high scoring dairy may, at times produce a badly contaminated milk, while a dairy scoring very low may produce clean milk.

(d) Thus, careful inspection of gross conditions and the rating of their value in terms of per cent on the government score card, together with milk inspection, particularly bacterial analysis, will enable any health department to correctly judge its milk supply.

In conclusion may we not hope to see the time when a govern-

ment milk hygiene service is established, probably under supervision of the B. A. I., for the control and regulation of milk production throughout the United States. When that time comes, let our embryo veterinarians be competent to form a very important part of that service.

VETERINARY EDUCATION*

R. W. GANNETT, Brooklyn, N. Y.

VETERINARY EDUCATION IN NEW YORK STATE: I shall not tire you by reciting the early history of veterinary education in this state or city. Many of you know that early history better than I. For our purpose here tonight I believe it is sufficient to go back twenty-two years, to 1896. At that time there were in New York City two private institutions teaching veterinary medicine: one, the American Veterinary College under Prof. Liautard, the other the New York College of Veterinary Surgeons. Both had done admirable work in meeting the demands of their time. Some of our best known older veterinarians of today were graduates of one of these two schools or of the veterinary department of Columbia University, which closed its doors at an earlier date.

In 1899 the American Veterinary College and the New York College of Veterinary Surgeons were amalgamated under the name New York American Veterinary College, Prof. Liautard, Dean.

When Cornell University was founded by Ezra Cornell in 1868, that broad-minded pioneer in education saw to it that veterinary medicine was included in the curriculum, under the direction of Prof. James Law.

From 1868 to 1896 there were only four graduates, three of whom, Daniel E. Salmon, A. M. Farrington and Fred L. Kilborn, have played an important part in building up veterinary education and veterinary service in this country, and are known, at least by reputation, to the members of this association.

Such men as Virchow, Darwin, Pasteur, Metchnikoff and Ehrlich laid the foundation of rational medicine and brought into the veterinary curriculum the consideration of a vast number of

*Presented at the meeting of the New York City Veterinary Medical Association, New York, N. Y., Jan. 2, 1918.

topics unknown to their predecessors. These subjects could not be taught by word of mouth alone, and consequently laboratories with delicate and expensive apparatus supplemented lectures. With the introduction of new subjects and new methods of teaching the cost of instruction increased, until the expense of properly training a young man to be a real veterinarian is today four times that of thirty years ago. The fees from students alone are entirely inadequate to maintain a properly equipped veterinary college. Accordingly, in 1894, the New York State Legislature established the New York State Veterinary College at Cornell University, and placed its control with the board of trustees of that institution.

Our law-makers at that time also recognized that the demands of the state required not more veterinarians, but better educated veterinarians. They also saw that if the number of veterinarians was increased materially beyond the requirements for such service, the profession would not offer sufficient inducement to attract young men of the right quality to enter the profession, or to hold a sufficient number of efficient veterinarians to safeguard the live stock industry from disease.

Therefore, in 1894, the legislature very wisely passed a practice law which required that before a candidate could take an examination for a license to practice veterinary medicine in this state he must have a preliminary education equivalent to graduation from a recognized high school with a curriculum of four years.

In 1896 the New York State Veterinary College at Cornell University was opened. On account of the high entrance requirements the number of students was small, eleven the first year. For several years the number of students increased very slowly. The principle of higher veterinary education was on trial. The average annual registration from 1896 to 1904 was 48. The average number from 1905 to 1915 was 109, and in 1916 it was 153. Prior to 1917, 407 students had been graduated. Of the 407 graduates 356 came from New York State. Of the 407 graduates 223 are in practice, 54 are veterinary inspectors with the federal government, 36 are teaching, 20 are engaged in laboratory work, 19 in dairy inspection, 9 are army veterinarians, 5 are in veterinary administrative work, 2 are professors of animal or dairy husbandry, 8 are unknown, 11 have gone into other business, and 17 have died. Of the 390 living, 246 are in New York State.

In 1917, 32 men were graduated, of whom 15 passed the ex-

amination for veterinarian in the regular army, and most of the others took the examination for the Veterinary Officers' Reserve. These men had intended to go into practice, but the declaration of war caused a change in their plans.

Most of the alumni for the first ten years accepted places in other institutions or in the federal government, and few of them went into practice. Since that time a great majority of the graduates have gone into private practice, largely in New York State.

In addition to the undergraduates, the college urges veterinarians of the state to attend any and all lectures and clinics that they desire. Many practitioners have availed themselves of this privilege to acquire special knowledge on certain subjects. Further, a two-day conference to which all licensed veterinarians in the state are invited, is held each year.

As required by the statute, the New York State Veterinary College at Cornell University has fulfilled its purpose as regards research and biological products. Some of the investigations have been of direct and immediate assistance to the live stock owners. A list would be too long for a paper of this kind. A few will be mentioned. From 1890 to 1897, heavy losses occurred among swine in the state, which could not be traced to any definite disease. A careful investigation resulted in the discovery that the hogs were poisoned from the ingestion of food containing powdered soap which had recently come into general use.

An operation for the relief of the condition in horses known as roaring was worked out successfully in the surgical department. This operation is used by many veterinary surgeons in this and other countries with much success. As a result, thousands of affected horses have been restored to usefulness. As has been said many times by Dr. Geo. H. Berns of Brooklyn in this and other association meetings, Dr. W. L. Williams of the veterinary faculty at Cornell University was the first veterinarian in this country to demonstrate the practicability of the radical operation for poll evil, quittor and infected navicular bursae from punctured wounds of the horse's foot.

Then there was the bob veal question. Extensive researches have demonstrated that young veal is not harmful for human consumption, even at an early age. This has resulted in modifying public opinion on the subject, with much saving to the state.

Extensive researches have been made with tuberculosis and the

experiments on the conservative method of handling this disease will be of much value in formulating methods for its control. The introduction of the sputum cup for finding spreaders, both among reactors and non-reactors, has proved to be of great assistance in detecting individuals dangerous to the herd.

Already the researches on contagious abortion has enabled veterinarians to restore many valuable sterile animals to fertility and check abortion.

Experimental work on hog cholera has demonstrated that the disease is often spread by scraps of pork which came from hogs that were infected at time of slaughter, thus giving the stock owners a new means of protecting their herds.

On several occasions information on special subjects have been published and sent to each veterinarian in the state, notably in the case of foot-and-mouth disease and hog cholera.

I have already stated that the New York American Veterinary College—a private institution—was established in this city by amalgamation in 1899 and continued as a private college until 1913, when it became a state institution, in name only, as no appropriation for maintenance or equipment was ever made. The number of graduates from 1899 to 1903, inclusive, was 40, an average of 8 per year. From 1904 to 1908, inclusive, there were 49 graduates, an average of about 10 per year. From 1909 to 1913, inclusive, there were 25 graduates, making an average of 5 per year. Since 1913, not counting the year 1916, the number of graduates has been 14 or about 5 per year. Not counting the class of 1916, of which I have been able to obtain no data, there have been graduated 128 men since 1899, of whom 73 have remained in this state. In the short time at my disposal to prepare this paper it has been impossible to get complete data. For instance, I cannot say how many of these 73 graduates are legal practitioners in the state. It is known, however, that there are probably 20 who finished the course, having been admitted on the condition that they obtain certain entrance requirements which thus far they have failed to do, but are entitled to their diplomas when they do so.

It would be interesting to know what these men are doing. Are they practising illegally? If so, who is at fault? The men or the college which allowed them to complete their course but did not insist that they get their preliminary education before doing so? Gentlemen, this, to me, is a serious condition of affairs. Must

our practice law be again broken down? Must 750 legal practitioners in the state be again humiliated and the profession again lowered to legalize such men as these who, in this case, have been done a rank injustice by the college from which they received their training?

In 1905, according to the report of the committee on intelligence and education of the American Veterinary Medical Association, the New York State Veterinary College at Cornell University gave a three-year course of nine months, the New York American Veterinary College a three-year course of six months. To learn the attitude at this time of certain veterinary colleges toward higher veterinary education one has but to read the answer to a question asked by this committee of the Deans of all the colleges in America. Here is the question: "Do you think that your school is being conducted up to as high a standard of efficiency as the educational demands of today require?" The answers of some of the colleges were as follows:

David S. White of the School of Veterinary Medicine, Ohio State Veterinary College, answered: "No. No school in the country does so."

Leonard Pearson of the Veterinary Department of the University of Pennsylvania, replied: "No American Veterinary College is as efficient as demanded by the needs of the country."

Dr. James Law of the New York State Veterinary College at Cornell University, replied: "We would gladly at once raise our standard if we had the means of doing so."

The Cincinnati Veterinary College, a private school, answers: "Yes, if it is not we only ask that the weak spots be pointed out and we will at once remedy same."

The University Veterinary College at Kansas City replied: "Without a doubt."

The Kansas City Veterinary College at Kansas City, Missouri, a private institution, replied: "Yes, as high as present conditions will permit."

Frederick A. Mueller of the Indiana Veterinary College, where the entrance requirements were a common school education and good moral character, replied: "Yes, we give all and more than the average student can absorb."

Prof. W. J. Coates, Acting Dean of the New York American Veterinary College which was then in session but six months in

the year, and, as most of you know, then had and now has inadequate facilities for teaching anatomy and operative surgery and with no clinical facilities for teaching the diseases of farm animals other than the horse; to the question "Do you think your school is being conducted up to as high a standard of efficiency as the educational demands of today require?" answered in the affirmative.

The faculty of the New York American Veterinary College failed to see to it that the college kept pace with the rapid advances that were being made in the development of veterinary education. Long conducted as a private school, the faculty failed to recognize or accept the principle well known in Europe that veterinary education to be efficient should be supported by the state. Unless I have been misinformed, it failed to fully recognize the authority of the state over veterinary practice. I have the word of some of the alumni that a diploma was looked upon as a license to practice, and thus students were encouraged to think likewise. Is it any wonder, considering this attitude and the inadequate instruction in the basic sciences of veterinary medicine, that many failed to take and many more failed to pass the state board examination? Nevertheless they entered practice contrary to the laws of the state, and helped to bring upon this society and upon the state the unpleasant and arduous duty of conducting prosecutions? Is it any wonder that the energetic Dean of this college has found it necessary to organize a night school to prepare illegal practitioners for their state board examination, thus attempting to finish the work that the college failed to accomplish? Is it strange that at every session of the legislature bills are introduced to break down our veterinary practice law?

Had the faculty of the New York American Veterinary College recognized their responsibility and obligation to their profession and to their students and accepted the principle that state support was necessary for efficient veterinary education, and had they been willing in the early nineties to make the necessary monetary sacrifice, and had they then prevailed upon the legislature to have the state take over their college, the first state veterinary college in America might have been located in New York City. They missed their opportunity, and opportunity rarely knocks but once.

In 1913 the legislature created a second state veterinary college to be located in New York City; a charter was granted and it

was distinctly understood that the name New York State Veterinary College at New York University was all that was desired, and that ample funds in the form of endowments and private subscriptions were forthcoming, if the college had the prestige of being known as a state institution. Since that time several bills have been introduced in the legislature asking for an appropriation for this college. It is evident that the promised private endowment failed to materialize.

The action of the legislature in 1913 in creating a second state veterinary college, in my opinion, was ill advised. We each have our opinions, and are entitled to those opinions; on the other hand, we should heed the words of such a veterinarian and teacher as Prof. David S. White of Ohio when he says regarding this act: "It is regrettable because of its effect not only upon veterinary education in New York but in the country at large. I know whereof I speak when I offer criticism of this ill-advised action. For twenty years the Ohio State University has suffered in growth and development and has been prevented from taking her place among her sisters in Michigan, Illinois, Wisconsin and Minnesota, because of the handicap placed upon her by the state's efforts to maintain and support three state universities. Due to political influences which I need not air at this time, this lack of policy on the part of past legislatures has caused her progress to be constantly impeded by a most pernicious form of parasitism. While our state is liberal in its support of higher education, in the division of the appropriations, our university must accept an allotment rarely sufficient to meet the actual needs of the situation. Consequently our university is unable to occupy her legitimate place in the line-up of universities of her ilk. That this unfortunate condition has not been good for higher education, in Ohio, has long been recognized by competent authorities, but it is only of late that the *people* have begun to realize it. There is now going up, however, a hue and cry against the present status of Ohio universities which is already beginning to show signs of crystallizing into an effective effort. Under the leadership of our wideawake Governor, higher state officials and broad-minded educators, there is organizing a zealous and enthusiastic army which with the slogan 'One State University for Ohio' will right this wrong done higher education in the state; when twenty-three years ago an unwise legislature rushed to the rescue of two corporate educational

institutions which were crumbling into decay. Will this history repeat itself in New York in so far as it concerns veterinary education? A continuance of the present two state school plan, however, I do not believe will be permanent. Sooner or later the people of New York will realize, as they are now realizing in Ohio, that the maintenance of two schools will mean a maximum cost and a minimum return. The time will come when the people will appreciate that to weaken appropriations, to lower entrance requirements and to weaken standards will mean a reduction in the efficiency of the output of the plant. I do not believe that there is at present, even in New York, an urgent demand for *more* veterinarians. The real need is not to increase the number but to improve the quality. The demand of the present day stockman is for the better educated, better trained veterinarian. Of the mediocre type he has had his fill. He wants quality, not numbers. To maintain a supply of high grade practitioners, sanitary officers, teachers and research men, schools of high class must be supported. As the efficiency of a properly administered school is in direct proportion to its income, there must be a concentration of the support upon fewer schools of high standard rather than its dissemination among a number of schools of low standard. 'What we need in the United States,' wrote the late Leonard Pearson, 'is a sufficient number of veterinary schools of high class, and not an excessive number of veterinary schools of low class.' New York does not need two veterinary schools. Maudlin sentiment and politics to the contrary. A two-headed calf is of no economic value to the stockman; its worth, if it have any worth, is purely fictitious; it represents a thing abnormal and always remains a monster."

Prof. John W. Adams of the University of Pennsylvania, who has had an opportunity to study veterinary education at all the leading European colleges, as well as at most of the veterinary colleges in America, says that "there is nowhere in the world today a well rounded veterinary college located in the heart of a great city." How could there be? Veterinary education now means a thorough training in anatomy, physiology and pathology of the diseases and their treatment of cattle, sheep, swine and poultry, as well as of the horse. In order to give adequate instruction in these subjects, the student must have an opportunity afforded by a clinic consisting of all these animals. No appropriation, however large, could provide such a clinic in New York City. According

to statistics given out by the Secretary of Agriculture, 1915, contagious abortion ranks next to tuberculosis in causing losses among bovines. In spite of the fact that some of the counties comprising Greater New York, especially Queens, have a greater cow population than some counties up state, is it possible to give adequate instruction in obstetrics and diseases of breeding animals in herds of this character where the cows are bought fresh and sold to the butcher dry?

I graduated from the New York State Veterinary College, Cornell University, in 1905. A year or two later I received a letter from the present Dean of the College asking for criticism of the veterinary course as given at Cornell. I well remember how I roundly criticized the inadequate clinical facilities that then existed, but this has since been changed. Last year the clinics treated over 3000 *diversified* cases, an average of 10 or 12 cases a day.

Despite the objections of the Ithaca veterinarians, a free ambulatory clinic has been established. How many New York City veterinarians of today have so much equine practice even that they can afford to contribute a portion to establish a free ambulatory clinic in New York City?

With the coming of the motor car for commercial purposes, it is conceded by every unbiased observer that the great field for the future veterinarian is in the country. The reduction in the number of registered veterinarians in cities is illustrated by the records of the New York State Veterinary Medical Society in 1909 and 1916, and the list of registered veterinarians published by the educational department in 1917. New York City, including the Bronx, in 1909 had 181 registered veterinarians; in 1916, 124, and in 1917, 104.

Brooklyn in 1909 had 96 registered veterinarians; in 1916, 71, and in 1917, 62.

Buffalo in 1909 had 31 registered veterinarians; in 1916, 27, and in 1917, 17.

Is another State Veterinary College needed? New York State has established a veterinary college under the supervision of Cornell University in which it has already invested $346,500 in buildings and equipment and is now able to furnish at this college veterinary instruction to enough students to insure a graduating class of from 35 to 50 men each year, and has graduated during the last five years an average of 32 students annually.

For the protection of its live stock interests the state requires about 25 new veterinarians each year. Its quota for the federal government requires from 5 to 10 more. Thus the State College already maintained is fully able to meet this need of the state and nation.

The State College at Cornell University has made many important investigations in animal diseases, and is now conducting others that promise to be of much value to the veterinarians and live stock owners. It also is furnishing all the diagnostic and prophylactic biologic products that the state requires. Further, it is doing all the laboratory diagnosis work called for by the Commissioner of Agriculture and practising veterinarians of the state.

It seems to me that the veterinarians of New York State as a professional whole and despite the inadequate training that many of us, including myself, received, are doing fairly well by the live stock industry. According to the year book of 1916 the value of the animals in New York State, not including poultry, is given as $234,139,000. The farm census of live stock and crops for 1915 gives $17,976,935 for the value of the poultry, making a total of $252,115,000. The estimated losses in New York State from animal diseases from reports given by the Secretary of Agriculture in 1915 were $7,717,000. Therefore, if we can rely upon these figures which are the most authoritative we have, the annual losses in New York State from animal diseases is about three per cent of the total value of the live stock population. This record can and must be improved; but it is the duty of every veterinarian loyal to his profession; it is the duty of everyone interested in the live stock industry; it is the duty of our legislators in particular, to mark well before they attempt to improve upon this record by lowering the standard of veterinary education in the state. 1st, by reducing the preliminary educational requirement as has been suggested by some of our leading veterinarians; and 2nd, by attempting to maintain two state veterinary colleges, thereby dispersing instead of concentrating effort, when the college established in 1894 at Cornell University, still incomplete, is able to satisfy all its obligations to the State and Nation respecting veterinary education and the preparation of qualified practitioners.

Gentlemen, I have endeavored by appealing to your reason and good judgment, to show that a second state veterinary college is not necessary. In this crisis in our history when the people of

this nation are called upon to economize in every possible way, in order that our soldiers and the soldiers of our Allies may be properly fed, clothed and equipped to the end that this world may be made safe for democracy and safe for our children, in such times as these this unnecessary expense upon the already over-burdened taxpayer, is, to my mind, an injustice to veterinary education in New York State.

To the alumni of the New York American Veterinary College, who are fostering this movement to have the state equip and maintain a second state veterinary college; to you, from the great body of the veterinary profession in the state, representing alumni of the Ontario Veterinary College, McGill, Cornell, Chicago and Ohio, besides from many of your own, comes the appeal to place the welfare of the profession above sentiment and personal interest. When France, the nation which gave us Lafayette, and has for three years given the flower of her manhood that democracy may not perish; when France, the symbol of sacrifice, is pleading for our aid, let it not be said of the students of Alexander Liautard that at such a time they asked our government to spend thousands of dollars in an unnecessary, selfish enterprise.

—Our War Aims. "What we demand in this war, therefore, is nothing peculiar to ourselves. It is that the world be made fit and safe to live in; and particularly that it be made safe for every peace-loving nation which, like our own, wishes to live its own life, determine its own institutions, be assured of justice and fair dealing by the other peoples of the world as against force and selfish aggression. All the peoples of the world are in effect partners in this interest, and for our own part we see very clearly that unless justice be done to others it will not be done to us. The program of the world's peace, therefore, is our program."—President Wilson's Message of January 8.

—Dr. F. W. Miller, formerly at Davenport, Iowa, is now stationed at Chicago, Ill.

—More than 150 veterinarians attended the December meeting at Purdue University, Indiana, for a war time conference.

—Dr. M. J. Williams, formerly at Magnolia, has been transferred to Lewisville, Ark.

CLINICAL AND CASE REPORTS

AN INTERESTING TUMOR

H. E. KINGMAN, Surgeon, and I. E. NEWSOM, Pathologist, Veterinary Department, Colorado Agricultural College, Fort Collins, Colo.

The case in question was that of an aged Shepherd dog presented at the clinic of this institution for treatment with the following history:

The dog was in the habit of opening a screen door that had a very stout spring on it, and as he passed through it usually caught

FIG. 1. The dog with area shaved to show the tumor

him on the side with a sharp blow. A circumscribed enlargement was first noticed by the owner about four months previous to the time he was presented at the clinic.

Symptoms. An enlargement over the right side about eight inches broad, fourteen inches long and four or five inches deep, covering most of the side of the thorax. The tumor was soft on palpation, except for three or four inches at the posterior end. Upon inserting a small cannula, a stream of blood escaped through it. After some minutes, although blood continued to discharge through the cannula, there was no diminution in the size of the tumor.

Treatment. The animal was anesthetized and Monsel's solution was injected through the cannula. The tumor was then dissected out with very little hemorrhage resulting. Because of the enormity of the denuded area, and the age of the animal, destruction was advised and carried out.

Post Mortem. Revealed many nodules throughout the lungs with one very large one in the mediastinal space. These nodules

FIG. 2. Right and left lungs showing multiple tumors of same structure as external one. Large tumor attached to the diaphragmatic pleura

had the same gross character as the one on the side of the thorax. There were no other lesions.

Microscopic Examination. Revealed large cavernous spaces filled with blood but in certain areas the vascular endothelium wa: in parallel rows with only a small amount of blood between. The diagnosis was made according to Mallory, as a malignant endothelioblastoma. We have no doubt other terms equally as good would be cavernous hemangioma, endothelioma and endothelio-sarcoma.

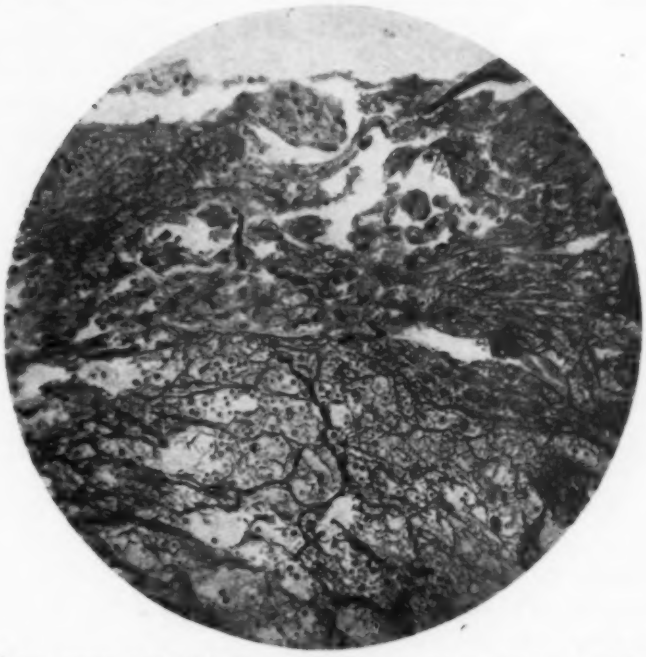


FIG. 3. Low power showing cavernous spaces filled with coagulated blood

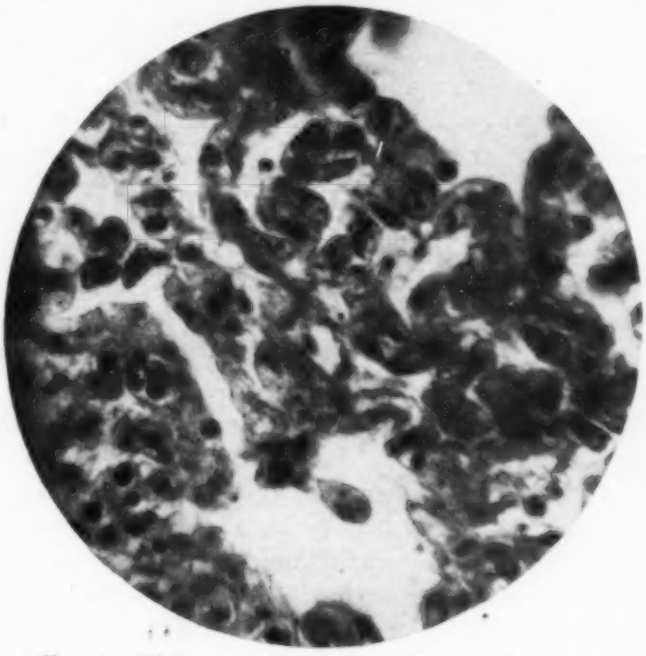


FIG. 4. High power showing endothelium in rows

WHITE LEAD POISONING
(Evidence of Pro-German Activity)

W. J. HARTMAN, Bozeman, Mont.

On Monday, December 10th, I went over to J. D. Miles' ranch, about 12 miles east of Wilsall, Montana. The foreman, S. J. Ross, a graduate of Williams Veterinary College, Edinburgh, 25 years, had come over to the Montana Agricultural College the Friday before with samples from stomach, heart, liver, and other organs of some calves. Seven head of yearling well-bred Herefords had died suddenly on the Miles place.

Eight head had been placed in a paddock that had a barn containing box stalls, just after weaning, about November 14th, and the animals had been fed alfalfa hay and rolled oats, as well as some straw. The first animal took sick and died suddenly Wednesday. Another, Thursday, and five more died Friday morning.

The general symptoms, as related by S. J. Ross, was undue excitability. The animals all had a very liquid diarrhea, almost black in color. Some animals were much excited, plunged and reared up in the stall, and all looked around at their flanks at times as though in pain. They had tenesmus, and difficult breathing with bloody froth coming from the nose before death. None of the animals was sick over 24 hours, some only six to twelve hours. All had high temperatures before death, 106° to 108°F.

Post Mortem Changes. Three of the animals that died Friday I opened Monday. The weather was cold and the carcasses frozen so that very little decomposition had taken place. The intestines contained a dark red, almost black, fluid material but no congested areas. The stomach lining peeled off very easily, which may have come from post mortem changes, although Ross stated this occurred on fresh post mortems. A sample jar of the contents of the first, second and third stomach was taken for chemical analysis. The lungs in all the animals were very much contracted, not occupying much over one-third of their normal expanse, occupying little more space than the heart, and yet were very red and congested. The left lung in two animals was torn and shattered much as though an explosion had occurred and blood had escaped into the chest cavity and into the muscles of the lower part of the neck. In one animal the shattered lung was on the upper side at

death. I opened the animals up through the sternum so there was no possibility of tearing the tissues with an ax or with broken rib ends. The third animal had both lungs torn with the blood extravasation. The lower lung in each animal had very little filling of blood that is usually found on post mortems. The blood in all carcasses had not coagulated but was fluid of a dark brown color and rather sticky. No swelling was present in the throat or any lesions present resembling hemorrhagic septicemia although slides and cultures were made to determine a possibility of the bipolar bacillus being present.

A 25-pound white lead pail was exhibited showing that ten or twelve pounds of lead had been licked out of the pail, also some remnants found in the young cattle troughs. This white lead pail had been transferred from a barn some distance by a supposedly pro-German fellow who worked on the place for three days prior to the cattle loss. Upon the death of these seven yearlings, the pail of lead was discovered and removed and then two other yearlings were placed in the same lot with the one remaining heifer left alive. However, no further loss occurred.

Prof. Burke of the Montana Agricultural College made a chemical analysis of the contents of the stomach from the four animals, and found large quantities of lead in each case. Even after precipitation of the liquid obtained with H_2S and then filtering, the clear filtrate gave again a heavy precipitate with potassium chromate. No evidence of salt was obtained in the white lead pail.

GENERALIZED MELANOSIS IN A PIG

E. M. PICKENS, New York State Veterinary College at Cornell University, Ithaca, N. Y.

This case came to the attention of Dr. W. H. Welch of Lexington, Illinois, who made a field diagnosis of generalized melanosis. Recognizing the rarity of this condition in pigs, he shipped the animal to the New York State Veterinary College for a post mortem examination to confirm his diagnosis. He requested, providing the findings warranted it, that a description of the case be published for the benefit of the profession. The author, therefore, wishes to thank Dr. Welch and to give him full credit for the case.

History. The subject was a Duroc Jersey about three months old. It was one of a litter of nine, all of which appeared to be normal at birth. It gave every evidence of being in perfect health until about six weeks to two months old when it practically ceased to grow. Shortly after this the skin lesions made their appearance. They developed very rapidly until the pig was killed for post mortem examination.

Findings. Exterior (1). On the left side of the head and above the eye was situated a nodule irregular in shape, about 2 cm. in diameter and raised above the surface about 1 cm. It was cutaneous. The enlargement was brownish black in color. On section it showed a central cavity about ½ cm. in diameter which was filled with a brownish black, rather watery fluid. The mass proper was composed of intensely black somewhat granular melanin.

(2). Just posterior to the base of the ear on the left side was situated a similar nodule about 3½ cm. in diameter and raised above the surface about 1½ cm. It was irregular in shape and was also cutaneous rather than subcutaneous. The whole top of this mass had evidently broken down revealing brownish black melanin of rather firm consistency and granular in appearance. Upon pressure a small amount of brownish black watery fluid exuded from it.

(3) On the left side and just cephalad to the anterior border of the scapula was located another cutaneous nodule of irregular shape. It was about 3cm. long, 2cm. wide and raised above the surface about 1 cm. The epidermis was intact and firm over it. On section the mass was firm and contained no fluid. It was intensely black and somewhat granular in appearance. The prescapular lymph gland was not involved.

(4) Just below this mass was situated another one about 5 cm. long by 2 cm. wide by 2 cm. thick. It was bilobed and situated subcutaneously. It was fairly movable. On section, it was found to be made up of a dense intensely black and rather firm mass of melanin. No fluid was observed upon pressure.

(5) On the same side and at the angle of the jaw was situated another nodule which extended to the point of the shoulder and from just below the base of the ear to the median line a distance of slightly less than 8 cm. The mass was nearly round and was situated beneath the skin. It was fairly soft, easily yielding

to pressure. On section, it was found to contain a central cavity about 4cm. in diameter which was filled with a brownish black watery fluid, probably the result of the breaking down of the melanotic tissue. The remainder of the nodule was fairly firm and intensely black in color.

(6) Slightly dorsal to the sternum and a little posterior to the above was situated another nodule about 2 cm. wide and 1 cm. thick. It was oval in shape and was located beneath the skin. It consisted of two lobes, the smaller of which seemed to fit as a cap over the anterior border of the larger one. On section, it was found to be composed of a dense intensely black mass of melanin, granular in appearance. No fluid could be detected even on pressure.

(7) On the posterior side of the front leg in the region of the knee, another mass was located. It was irregular in shape and measured 3x1½x1 cm. It was situated subcutaneously and was rather firm on pressure. It was flattened posteriorly and due to its location caused the animal some inconvenience in walking, making the leg nearly stiff at the knee. On section, the mass was found to be firm and was composed of the usual intensely black and granular appearing melanin. No fluid was detected on pressure.

(8) The right eye was much enlarged and protruded about 2 cm. out of its socket. The sclera could only be recognized by its position. It consisted of a tough brownish black membrane continuous with the conjunctiva. The mass was rounded from forward back and was about 3 cm. in diameter. It easily yielded on pressure. On section, it was brownish black in color, soft, granular and contained a small amount of whitish slightly viscid fluid or semifluid resembling pus, with a decided odor. The mass proper was made up of the usual brownish black pigment but somewhat softer in consistency than has before been noted.

(9) Just above the angle of the ilium a cutaneous enlargement about 3 cm. in diameter was observed. It was circular and was raised about 1½ cm. above the surface. The skin over it was broken, hairless, dry and hard where intact. On section, the nodule was found to contain a small amount of a brownish black watery fluid in its centre. The enlargement proper was made up of a dense intensely black mass of melanin.

(10) In the right flank just anterior to the shaft of the femur was situated a cutaneous nodule about 4 cm. in diameter,

spherical in shape and raised above the surface 1½ cm. It was rather firm and the hair had disappeared. On section, the mass was found to be made up of many somewhat degenerated finger-like projections similar to those often observed in a papilloma in which the papillae grow out instead of down into the tissue. These finger-like projections were all literally filled with melanin giving them an intensely black color.

The external lymph glands were either entirely normal (macroscopically) or contained only a small amount of pigment in their capsules. None could be detected within the substance of the glands.

INTERNAL ORGANS. *Heart.* Practically normal. No melanosis whatever was observed in this organ.

Lungs. Both lungs contained numerous dark colored areas varying in size from just visible to about 1 cm. in diameter. The largest pigmented area was situated at the inferior border of the left diaphragmatic lobe. It was irregularly round and was about 1 cm. in diameter. It was brownish black in color and was firmer than the normal lung surrounding it. Most of the other areas were smaller and of a lighter color.

Mediastinal Lymph Glands. Their capsules were brownish in color which was due to pigmentation. No melanin was observed within the gland.

Bronchial Lymph Glands. These, like the above, showed pigmentation of the capsules but none within the glands. They were of normal size.

Liver. The liver was practically normal with the exception of several darkened areas of pigment varying in size from just visible to nearly 1 cm. in diameter. These areas were not numerous and with the exception of the color resembled normal liver.

Stomach. Normal.

Intestines. Scattered throughout the large intestine were a few black colored areas, the largest of which were about 8 mm. in diameter. The pigment was found to be present in all the coats.

The Mesenteric Lymph Glands. These glands were not affected.

Kidneys The left kidney showed one area of pigmentation in the cortex and extending down a short distance into the medulla. It was about 4 mm. in diameter on the surface of the organ. The right kidney contained four visible areas of pigmentation,

the largest of which was about the size of an ordinary petechia. These areas appeared to be confined entirely to the cortex.

In the right sublumbar region and beneath the last two lumbar vertebrae was an irregular lobulated mass situated under the peritoneum and measuring 5 cm. x 2½ cm. in its widest place and about 2 cm. thick. On section, it was found to be composed of a dense intensely black mass of melanin. No fluid was observed.

Brain coverings and cord were normal.

Histological Examination. The cutaneous nodules resembled papillomata, some of which showed the papillae growing down into the subcutaneous tissue while others showed the papillae growing out from the surface. In both forms of the nodules many of the epithelial cells contained melanin varying in quantity from a very small amount to masses of dense melanin. Large masses were observed in which the entire papillary structure was broken down and the melanin extended down into the subcutaneous tissue. In this tissue the pigment was observed in quantities varying in size from small points just visible to large intensely black masses 1 mm. in diameter in which only a supporting connective tissue remained. This supporting tissue contained the blood vessels. Many polynuclear leucocytes, some of which contained melanin, were noted scattered through these nodules, especially in those in which the surface of the epidermis had become broken, thus presenting an avenue of entrance for infection.

The subcutaneous nodules were made up of dense masses of melanin held in rather heavy connective tissue stroma. The masses varied in size from points just visible to black areas 1 mm. in diameter. These areas were irregular in shape. The original structure of muscle, etc., was entirely destroyed.

Lymph Glands. The lymph glands involved always showed much melanin in the capsule. The trabeculae were also found to contain some pigment. Very rarely small quantities of the pigment were observed in the medulla both in the lymphocytes and in the interstices between them.

Liver. In this organ the pigment seemed to have first been deposited in the interlobular tissue both in the connective tissue cells and between them. In places where the melanin was dense the liver cells had entirely disappeared. The pigment was held in a connective tissue stroma which also contained blood vessels as in the other specimens described. The liver cells in the immediate

vicinity of the heavy melanin deposits were badly degenerated. In a few places small amounts of melanin were observed within the lobule and immediately around the central vein. The deposits generally were brought in, however, from the periphery and the central portion of the lobule was the last to become affected. Also in a few places small amounts of melanin were noted in the intima of the blood vessels which would lead one to believe that it had been deposited here by the blood.

Kidneys. A few areas of melanin were noted both in the cortex and the medulla. The masses were small and generally brown in color instead of black, showing that the pigment was not as heavily deposited as in the liver. These areas were generally situated between the cells rather than within them. The kidney cells were broken down in the vicinity of the melanin deposits. The glomeruli were in no place noted to be affected.

Lung. The lung tissue generally showed a slight amount of active congestion. Scattered irregularly throughout nearly the entire organ were areas in which the air sac walls contained melanin. Numerous bronchi were also affected. In these the melanin was present in the epithelium as well as beneath it. These areas generally contained but little of the pigment. There were, however, several places where a heavy deposit of the pigment was present. In these areas the lung tissue was entirely broken down and the melanin was deposited in a connective tissue stroma as described in the other nodules.

The pleura contained a small amount of melanin in places. The areas were not large, however, and the normal tissue was not destroyed.

Eye. The examination of this organ showed no changes that have not been mentioned under the subcutaneous nodules. There were absolutely no tissues remaining which could be identified as normal. The structure was completely changed.

Diagnosis. Generalized melanosis.

PLATE

Fig. 1.

Fig. 2.

Fig. 3.

DESCRIPTION OF PLATE

Fig. 1A. A. Melanotic nodule between eye and ear. B. Nodule at base of ear.

Fig. 2A. Large melanotic mass extending from the ear to the ventral median line. B. Melanotic nodule back of the ear.

Fig. 3A. Melanosis of the eye.

TRAUMATIC PERICARDITIS*

JAMES A. PENDERGAST, Syracuse, N. Y.

A large Holstein cow five or six years old was noticed to refuse her feed on Nov. 9th. Her temperature was 105½; pulse 75. There were increased respirations; the bowels were moving very little. Administered a dose of physic and gave some fever medicine. also a little strychnine and gentian. The next day, Nov. 10, the temperature was 103½ and she was apparently better with the exception of the increased respiration; the bowels were moving freely. She ate some hay. Nov. 11th, appeared in same condition, except lesions of the heart developed. There was tenderness on the left side over the heart. The head was held low and the pulse was about 85; respirations about 40; temperature 105; while examining the animal she had a severe chill which lasted about an hour. In the afternoon the animal perspired freely. Suspecting a foreign body and the animal being a very valuable one the owner wished consultation.

Upon examination by consulting veterinarian we decided the animal was suffering from pericarditis. The temperature was 105½; pulse 85; respirations 48.

We differed as to the cause of the trouble. He did not believe the trouble was caused by a foreign body, but I still held that it was the cause. The line of treatment was changed and next morning the animal appeared the same except the temperature was 101½. The next day the temperature was 107½. The next day the symptoms were about the same but she was getting weaker and was unable to get up on her feet. She died during the night.

Post mortem revealed extensive pleurisy on the right side with quite a quantity of fetid fluid in the pleural cavity. A finishing nail about 3 inches long had penetrated the apex of the heart, going clear through its wall. The heart was adherent to the pericardium at the point of entrance of the nail. The pericardium was inflamed and thickened but little. It was dark purplish in color and contained very little fluid. Several abscesses showed along the course of the nail.

*Presented at the meeting of the Central New York Veterinary Medical Association, Syracuse, N. Y., Nov., 1917.

I have seen many cases of heart lesions caused by foreign bodies, but this is the first one I have seen which actually punctured the heart.

CASE REPORTS

R. A. STOUTE, Government Veterinary Surgeon, Barbados, West Indies

STRANGLES. One case occurred in a two-months-old colt; the other in a twenty-year-old stallion. Both cases occurred in one stable and both recovered. The rarity of the cases increases their interest.

CASE OF PARTURIENT APOPLEXY IN A GOAT. This is the first case of its kind I have seen during thirty years' practice. The symptoms and treatment were the same as in cattle. A few hours after the udder was inflated the animal was standing and apparently well. Since this occurred I have noticed a case reported in the *Veterinary News.*

THE BARBADOS GOAT SOCIETY. The Seventh Annual Show of the above society was held at Queen's Park on December 12th, 1916. The following is the result:

CLASS 1—MILCH GOATS (MORE THAN ONE LITTER OF KIDS) 9 ENTRIES

No.	Name	Owner	Days in Milk	Yield of Milk	Points		Total	Award
					Time	Milk		
				lb. oz.				
1	Snowdrop	D. H. Carter	301	5.14¼	3.34	5.89	9.23	$10
2	Albertha	W. Smith	300	4.6¼	3.33	4.39	7.72	6
3	S. Ann's Antelope	R. F. Parkinson	437	2.11	4.	2.68	6.68	4
4	Diamond	L. A. Stoute	238	3.14	2.64	3.87	6.51	2
5	Iris C.	W. A. G. Cecil	224	3.10	2.48	3.62	6.10	
6	Ann	B. Warren	218	3.6¾	2.42	3.42	5.84	
7	Woodville	Mrs. H. N. Leacock	280	2.2¾	3.11	2.17	5.28	
8	Beautiful II	Mrs. H. N. Leacock	279	1.8¾	3.10	1.54	4.64	
9	Johnson II	C. S. Carter	289	1.5	3.21	1.31	4.52	

CLASS 2—MILCH GOATS (ONLY ONE LITTER OF KIDS) 5 ENTRIES

1	Enfield Nancy Lee	H. W. Parkinson	393	2.8½	4.	2.53	6.53	$8
2	Ella C.	W. A. G. Cecil	319	2.8¾	3.54	2.54	6.08	6
3	Josie	A. R. Archer	253	2.12	2.81	2.75	5.56	4
4	Gennie	A. L. Gibbs	314	1.14	3.48	1.90	5.38	2
5	Crystal	R. F. Parkinson	186	3.3¾	2.06	3.23	5.29	

CLASS 3—DOE KIDS—15 ENTRIES

Name	Owner	Award
1 Lucy Baldwin	J. H. Murphy	$6
2 Tick C.	C. A. Evelyn	4
3 Princess Echo C.	W. A. G. Cecil	2
4 Min	H. C. King	1

CLASS 4—BUCKS—4 ENTRIES

1 Hubert	L. H. W. Mann	$6
2 Dalwin	C. S. Hunte	3

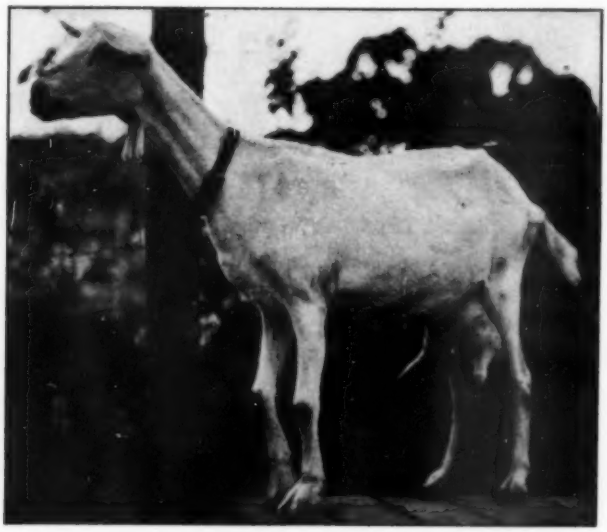
The First Prize and a Diploma of Merit in Class 1 was given by the Imperial Commissioner of Agriculture, West Indies.

The two prizes in Class 4 were given by the Barbados Agricultural Society.

A Diploma of Merit was given to the winners of Classes 1, 2 and 3 by the Superintendent of Agriculture.

A prize of $5 for the goat giving the most milk at the Show was won by "Snowdrop" in Class 1.

Any exhibit winning over 5.00 points is entitled to a Red * after her name in the H. B.



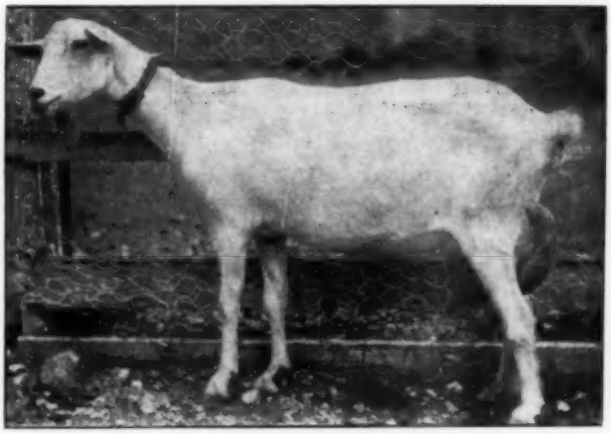
SNOWDROP

Taken after first kidding

SNOWDROP { Peter. Imp. Saanen
Locust { Bruce. Imp. Togg.
Dam: Black Rock. Imp. Ang. Nub. Common

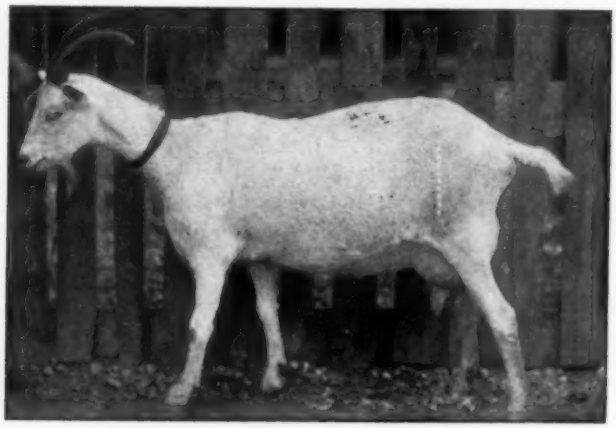
Date of birth Mar. 28, 1915. I kidded April 18, 1916. Greatest milk yield in 24 hours July 31, 9 pints, 3 gills. Dec. 20, 4 pints. Dec. 31, dry. II kidded Feb. 14, 1917. Greatest milk yield in 24 hours Mar. 30, 14 pints, ½ gill. Nov. 23, 10 pints, 1 gill.

SNOWDROP
Taken after first kidding



"IRIS C" No. 109

Sire: Franz. Pure Saanen. Dam: Ibere. Half Togg. Born Feb. 17, 1914. Kidded May 5, 1915. Color: White. Breeder: W. A. Cecil, Exmouth, Barbados. This goat gave 8½ pints when fresh and gave milk 1 year and 10 months. She took ten blue ribbons at the show in 1916, after milking 588 days and milked 2 lbs., 13 oz., the morning of the show. She gave approximately 3,000 pints in this her first lactation. She again kidded May 2, 1917, and gave 12½ pints when fresh. She is now giving 7½ pints.



"ELLA C" No. 141

Sire: Baldwin. Pure Saanen. Dam: Iris C. Half Saanen. Born May 5, 1915. Kidded January, 1917. Color: White. Breeder: W. A. Cecil, Exmouth, Barbados. This goat gave, when fresh, 10½ pints and is now giving 6½ pints and 2½ months in kid.

ABSTRACTS FROM RECENT LITERATURE

INTERESTING OVARIOTOMY IN A TROUBLESOME MARE. Capt. Guy Sutton, F.R.C.V.S. *Veterinary Journal.*—After the usual preparation of cleanliness, a dose of arecoline was given midway during the 48 hours' fasting prior to the operation. The operation was performed with the animal in stocks and partly chloroformed. The right ovary was removed. While feeling for the left, a large spherical mass was grasped and dropped in the hands of the operator. It was a large blood clot, spherical and with about a fourth of its bulk fibrinous, the remaining portion being of ox liver color. The normal ovary was then looked for and removed. It was completely ruptured throughout the length of its greater curvature and having the appearance of a split kidney. The blood clot had been enclosed by the two split hemispheres and a thread of stretched and separated peritoneum. It is supposed that the ovary was acutely congested and that the arecoline was the immediate cause of the rupture. The right ovary weighed 3 ounces, the left 6 and the blood clot 9. The patient made an excellent recovery.

A. L.

STRONGYLUS ARMATUS IN THE TESTICLE OF CRYPTORCHIDS. Major F. Hobday, F.R.C.V.S., F.R.S.S. *Veterinary Journal.* This is a concise record of the operation performed upon a bay horse which, while under treatment for ophthalmic trouble, manifested a "rig" when he made the attempt to serve a mare.

Cast and chloroformed, the left cord was found in the canal but on the right the testicle was found in the abdominal cavity, from which it was removed. Upon being cut open, three perfect specimens of *Strongylus armatus* were discovered. Recovery was without any event. A. L.

ON THE PRESENCE OF BACILLI OF THE TRUE PARATYPHOID B GROUP IN THE INTESTINES OF HEALTHY PIGS. A. Trawinski. *Zeitschr. für Hygiene*, Vol. 83, No. 1, p. 117, 1917. Abst. in *The Review of Bact., etc.*, Vol. VII, Part 2, 1917, p. 38.—The importance of the presence of pathogenic organisms of the paratyphoid B group in the intestines of healthy animals used for food is obvious, and investigations, the results of which are briefly recorded in this paper, on this subject are numerous. Trawinski has investigated material from the intestines of 500 healthy pigs, and isolated 26 strains (5.2 per cent) belonging to the typhoid colon group. These were then investigated very fully as to their colony type, fermentation activity, serum reactions and pathogenicity; and were compared with organisms of the true paratyphiod B group (*B. suipestifer*, *B. aertryk* Nobele, *B. typhi murium* and *B. psittacosis* Nocard). Two strains belonged to the paratyphoid B group, and were identical with *B. suipestifer*. Eight, which had a special colony type, differed from the paratyphoid B group in not fermenting sorbite. They formed indol, and showed a serological relationship with *B. aertryk*, and in part with *B. suipestifer*. A third group of 16 strains did not ferment dulcite and sorbite, formed indol, were not so pathogenic as the first and second groups, and were agglutinated with serum of the paratyphoid B group; but their own antiserum did not influence this group. REICHEL.

CONGLUTINATION TEST FOR THE DIAGNOSIS OF GLANDERS. H. W. Schoening. *Jour. Agr. Res.*, Vol. XI, No. 3.—In this contribution to the meager literature in English on conglutination, the author has given a brief resumé of the theory of this reaction and has presented in a very concise and clear manner directions for the application of the test.

The results of a comparative study of the conglutination and the complement fixation tests for glanders on a considerable number of samples of both horse and mule sera together with the autopsy findings in many of the positive cases are tabulated and described.

The article is summarized as follows:

1. The conglutination test for glanders is a specific complement deviation reaction.

2. It should be used in conjunction with the complement fixation and agglutination tests, as no one test is infallible.

3. The conglūtination test, as has been noted by others, is a more sensitive test than complement fixation and absolute accuracy in the technic is necessary to obtain good results, as a slight excess of any of the ingredients of the conglutination system will lead to a misleading reaction.

4. The condition of the serum to be tested should be perfect in the conglutination test, although, if necessary, an unsatisfactory sample may be used by titrating it against the conglutination system.

5. In the testing of mule serums and those horse serums possessing non-specific complement-fixing bodies, the conglutination test is superior to the complement-fixation test.

L. T. GILTNER.

DEALING WITH PUNCTURED AND SUPPURATING EYEBALLS. Capt. A. R. Routledge, A.V.C. *Veterinary Journal.*—With cocaine as a local anesthetic, under the usual antiseptic care, the cornea was punctured and excised with a circular incision following the sclerotic junction. As the eyeball was smaller afterwards, a portion of the membrana nictitans was excised. If left intact it would bulge and be exposed to the air, and chronic purulent discharge from the eye would be the result. The operation wound healed in from 14 to 21 days.

Advantages claimed: eye healed rapidly; had a very natural appearance; the unsightly cavernous look, usual when total extirpation occurs, was avoided. Chronic discharge seldom follows. Sometimes, if the shrinkage of the ball is great, the upper eyelid becomes inverted, then the ordinary entropion operation puts the matter right again. Operation on the lower lid is not beneficial and is not advisable.

A. L.

PECULIAR TEMPORARY PARALYSIS OF THE MUSCLES OF THE NECK. Capt. C. H. S. Townsend, M.R.C.V.S. *Veterinary Journal.*—A bay charger mare, 9 years old, had never been sick. One day she was found head down, with nose resting on the ground. She was in no pain and ate grass off the ground. All functions were normal. The head, when lifted, dropped down when it was not supported. No diagnosis was made. The condition was the same next day, the head was swollen, chiefly along the cheeks. Temperature had gone up to 103.8°. Pulse full and quick. Respiration loud. Four drams of aloes were given. The following day the mare stood normally, head erect, functions normal. The swelling was reduced. No treatment was adopted and in 3 or 4 days the animal made an eventful recovery. A. L.

NOTES ON PARASITIC ANAPHYLAXIS AND ALLERGY. F. Van Es and A. F. Schalk. *Bulletin No. 125*, North Dakota Agricultural Experiment Station.—Severe reactions followed the injection of either bot material or a solution of the secretions of the larvae into horses. Blood from these horses injected into other horses caused a reaction. The intoxicating substance is dialysable. Inserted directly into the stomach it caused a slight reaction. Neither bot material nor blood from injected horses produced any diseased condition similar to swamp fever. The nature of the reactions suggests an anaphylaxis due to sensitization from previous invasion. Nonparasitic anaphylactic shock is also shown to take place. Colts also reacted to the parasitic anaphylactic material. The colts were either sensitized by the Gastrophilus larvae already present in the stomach or passively by the mother's milk. Small embryos of Gastrophilus may have been the cause. Material from parasites other than Gastrophilus larvae brought about a reaction. Reaction also occurred in animals other than the horse. Some reactions resulted in response to both eye and intradermal tests. This shows evidence of the allergic sensitization of the host against substances produced by the same parasite. It is considered a very reasonable assumption that if anaphylactic sensitization can be shown so well in vivo that it can be shown in the test tube. HAYDEN.

CLINICAL CASES. S. E. Sampson, M.R.C.V.S. *Veterinary News.*—Under this heading the following are recorded by the author:

INVERSION OF THE BLADDER.—This occurred in a six-year-old mare, after foaling and the accident was left uncared for several days. The diagnosis was difficult to make on account of the lesions of the organ but the inversion was finally reduced. It, however, returned under the straining of the animal and it was only after having cast and chloroformed the mare that another reduction could be made and maintained by the aid of a mechanical pessary in the shape of a balling stick well protected at the end with cotton wool. A pessary of salol was then introduced into the bladder and the mare being allowed to rise, the mechanical pessary was again introduced and held in place by sutures of the vulva. It was left in place until the next day. Morphine hydrochloride was given as a sedative. Recovery was complete after a few days of purulent discharge from the vulva.

COCCIDIOSIS IN THE HORSE.—This was found in the examination of the intestines under the microscope. It occurred in a hunter four years old which had ailed for some length of time and after long treatment and tests with tuberculin and mallein, was finally destroyed.

TETANUS AFTER CASTRATION.—Twelve days after being castrated a yearling was affected with lock jaw. He was turned out and left in the open field without other treatment than a small physic ball and extract of belladonna given twice a day in sloppy mashes. He recovered in 10 or 12 days.

EVERSION OF THE UTERUS IN A MARE.—A four-year-old mare had cast her foal two months before her time. She had a mass hanging from the vagina which the owner thought was the cleansing. It was instead the uterus which was covered with feces and dirt. After thorough washing and cleaning, the author replaced the organ with the aid of a pint bottle. A boric acid and iodol pessary was left in the uterus and the vulva sutured. Complete recovery followed. A. L.

INVESTIGATIONS ON THE PREVENTION OF NUISANCES ARISING FROM FLIES AND PUTREFACTION. F. W. Foreman, M.A., F.I.C., and G. S. Graham-Smith, M.D. Abst. from *Jour. of Hygiene*, Vol. 16, No. 2, Oct., 1917, pp. 109-224.—*Conclusions.* 1. Experiments with the bodies of horses show that they behave in the same manner as those of smaller animals, and can be efficiently treated in the same ways. A body was preserved by surface treatment

alone for a long period, and produced no appreciable nuisance from smell.

For large carcasses relatively less fluid is required for surface treatment owing to the relatively small ratio of surface to weight.

2. The treatment of human bodies under war conditions has given satisfactory results.

3. Flies have been kept from entering such places as dugouts by hanging sacks treated with creosote oil mixtures over the entrance.

4. Adult flies in dugouts and other situations and on putrescent material are killed by spraying.

5. Latrines have been kept free from flies by spraying.

6. Manure should be treated by spraying with creosote oil at the earliest opportunity. If made into heaps each incremental addition should be spread uniformly on the heap and sprayed at the rate of at least 100 c.c. per horse per day. The manure does not seem to be injured by this treatment.

7. In towns the breeding places of flies could probably be treated with little expense, and the numbers of flies very greatly diminished.

8. The chief objections to the use of creosote oil for such purposes are (a) its irritant action on the skin and mucous membranes, (b) its inflammability and (c) difficulties in transport. In view of the excellent results obtained the objections are of little importance. In our experience its irritant action on the skin is very slight, and the eyes can be protected by the use of glasses when spraying; its inflammability is low except when used as a spray, and suitable precautions could be easily employed. The difficulty and cost of transport have to be weighed against the economy in labor, since a single treatment with creosote oil is more efficient than many with 5% emulsions of disinfectants.

General Summary. 1. Flies may be killed either by poisons (a) absorbed from the alimentary tract, or (b) acting through the respiratory system. They are very resistant to many alimentary poisons which possess considerable toxicity to animals, but are more susceptible to respiratory poisons.

2. As very little difference could be made to the general fly population by killing adults alone we have not persisted with experiments designed for this purpose. Aniline is the most suitable of the reagents, not dangerous to man, used in the way suggested, which we have tested.

3. Flies are most easily and effectually destroyed by attacking them in their immature stages as eggs or larvae.

4. The eggs of species likely to be dangerous to man by conveying infected material to his food are laid on (a) exposed animal matter, (b) manure, and (c) refuse.

The eggs of maggots in these situations may be considered to represent large numbers of flies in traps.

5. For killing eggs or larvae in their breeding grounds we found coal-tar oils, especially creosote oil, to be the most satisfactory reagents. Aniline emulsions are useful, but have little effect on putrefactive processes and the nuisances due to them.

6. Flies may be repelled from substances which attract them, such as decaying bodies, fecal material, etc., and kept out of habitations by means of the repellant constituents of coal-tar oils.

7. Flies sprayed with these oils are killed.

8. In carcasses true putrefaction or disintegration is preceded by (a) early gas formation, mainly due to the action of intestinal organisms on the carbohydrates of the intestinal contents and tissues, (b) exudation of fluid, probably due to the effects of cytolysis and enzyme action, and (c) green discoloration of the skin which appears to be connected with the effect of hydrogen sulphide or organic acids on the blood pigments. By suitable treatment the tissues may be rendered sterile, when neither gas nor green discoloration is produced though fluid exudes.

9. By true putrefaction in carcasses we mean the breakdown of the tissue constituents, accompanied by the elimination of foul-smelling products. The process is due to the activity of putrefactive bacteria assisted by the action of tissue enzymes. Gas production and exudation of fluid continue as true putrefaction proceeds, but in much smaller daily increments than in the preliminary stages.

10. Descriptive methods are lacking in precision and do not give definite information regarding the progress of putrefaction. The need arose therefore for a method by which the actual products of putrefaction could be estimated. The importance of the combined activity of autolytic enzymes and putrefactive organisms in the disintegration of a carcass was impressed upon us by noting the great rate of production of volatile bases in tryptic digests containing such bacteria.

The putrefactive powers of various species of bacteria can be

measured definitely by incubating an amino acid mixture containing the organisms under standard conditions for a suitable time and determining the ratio of bases to amino acids.

We claim that by similar means the relative powers of different disinfectants to inhibit the action of putrefactive organisms on carcasses (kept under standard conditions p. 209), can be compared precisely, using for analysis the fluids which exude or tissues from comparable situations.

The proteolytic as well as the deaminating enzymes of autolysis produce small amounts of ammonia. The results of their combined activity, in the absence of organisms, yield a low ratio of volatile bases to the substances which respond to the formyl titration. If putrefactive organisms do not develop in a treated carcass the same low ratio is obtained. The ratio is correspondingly greater the more active the organisms.

Our method enables us to measure the progress of putrefaction under all conditions, provided the reagents used to inhibit putrefaction do not interfere in the estimations.

11. The stenches arising during putrefaction are mostly derived from acid and basic products and from sulphur bodies. An ideal deodorant should be capable of fixing or absorbing all foul-smelling bodies.

12. We believe that putrefactive bacteria mainly gain entrance into the tissues through the skin.

13. The presence of water and a high temperature provide optimum conditions for the progress of putrefactive changes.

14. In the superficial treatment of intact or opened carcasses and other putrescible materials reagents should be used which adhere to the greasy surfaces, form films, render the skin waterproof and kill the bacteria in it, thus checking putrefaction by preventing the access of water and putrefactive bacteria to the tissues. Further, the reagent should be capable of eliminating any stenches which may arise, repelling flies, killing the eggs or larvae, resisting the action of water and remaining operative in all respects for a long period.

15. Watery emulsions of disinfectants are necessarily deficient in most of these properties. Undiluted oily reagents only possess them.

16. By superficial treatment combined with injection of certain reagents into the blood vessels exposed carcasses may be preserved for months.

17. The burial of carcasses does not prevent the development of larvae present on them, or the subsequent emergence of the flies.

18. In our experience the reagent, which possesses the required properties to the greatest extent, and gives the most satisfactory results in practice and is sufficiently cheap and easily obtained for use on a large scale, is coal-tar creosote oil of "country make".

19. For general purposes, especially when the repelling of flies is of importance, we recommend the use of coal-tar creosote oil of country make, containing a high percentage of phenolic bodies, to which sufficient bases, extracted from "light oil", are added to make the proportion of bases to phenolic bodies approximately one to two. REICHEL.

RADICAL OPERATION FOR UMBILICAL HERNIA. R. Hudson, F.R.C.V.S. *Veterinary Record.*—It was a large sized hernia in which the opening of the abdominal wall was between 5 or 6 inches long, with edges very thin. After careful preparation, an incision exposed the sac, which was separated with the fingers and the point of union of the umbilical cord carefully left attached to the sac. This was then squeezed from end to end and as no adhesion was detected it was twisted and a needle carrying strong silk worm gut ligature passed through close to the opening. Although passed tightly round and tied, it slipped and another means of suture had to be resorted to. This was made with only one wire suture passed through and through skin and peritoneum on the center of both edges of the opening and other sutures made with strong silk worm gut were passed above and below the metallic suture. When these were completed, the wire was removed. There was much skin to be removed to permit a good adaptation of the edges of the abdominal incision. The horse did well. A. L.

RARE CYSTIC CONDITION. L. Lynn Lloyd, M.R.C.V.S. *Veterinary News.*—A four-year-old cow was expected to calve in three months. She was taken ill and said to be "blown". Gas escaped by way of the œsophagus but it was doubtful if the case was one of tympanitis. Notwithstanding treatment the cow kept distended in such a way that more than twelve days after her first illness she literally could not be brought out through the byre door. Rectal

examination revealed an enormous distension of what was supposed to be due to the uterus. Finally an exploratory puncture of the rumen was decided upon. On withdrawing the trocar there was no escape of gas but a fountain of clear water. The jet continued by internal pressure and it was forced in the form of an arch falling several yards away. Pressure on the right flank accelerated the flow and nearly three large bucketfuls were withdrawn, much to the relief of the animal, which later recovered and aborted a few days after. What was the lesion? A. L.

A Record in Temperature. Capt. H. Leeney, A.V.C. *Veterinary Record.*—This was observed in a light draught horse. The thermometer registered 108.4° at 4:30 P. M., and confirmed fifteen minutes later at 108°. The next day it had dropped to 100° and later to 98.4°. The animal had been feeding all along, looked quite well and had nearly a normal appearance in pulse, respiration and condition of the membranes. A. L.

The Thyroid and Parathyroid Glands. Dr. Mark White. Reprint from the *Chicago Medical Record Journal.*—The complex nervous symptoms arising when the functions of the parathyroid and thyroid are abnormal may be spoken of as thyrosis. The symptoms may be present without the presence of a thyroid goiter.

Blood from animals with hypoparathyrosis furnishes a thyroid antitoxin. The antitoxin injected in 2 c.c. doses into the thyroid gland or muscle of the arm once or twice a month has, according to the author, a specific curative effect in thyrosis. With goitrous thyroid complication it is necessary to use a chemical or iodin preparation to aid in the reduction of the goiter. The chemical is injected into the goiter, usually once a month. Hayden.

—Dr. N. F. Williams, president of the Texas Veterinary Medical Association, urged before the legislative investigating committee that the Live Stock Sanitary Commission should be reorganized and that its executive officer should be a graduate of a recognized veterinary college; also that the board of Veterinary Medical Examiners be reorganized with a view to enforcing stricter requirements for obtaining licenses to practice in Texas.

ARMY VETERINARY SERVICE

THE ORGANIZATION OF THE VETERINARY CORPS OF THE NATIONAL ARMY*

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Why is a veterinary corps needed in the National Army? Even if for the present the Army use no cavalry at the front, there will be employed more animals per man in this war than in any war in history. For each three and a fraction men in the National Army there is one public animal. If we raise an army of three and a fraction millions of men, one million animals (horses and mules) will be needed. To protect the health and preserve the efficiency of so large an aggregation of animals is a formidable problem. To attain these objects, a well organized, manned and equipped veterinary corps must be available to prevent the introduction or spread of communicable diseases; to reduce losses from illness or injury by the prompt application of proper treatment; to relieve the mobile organizations in the zone of advance of the sick or injured animals which might impede their movements; to treat in hospitals on lines of communication the animals which can be restored to a serviceable condition, and to inspect the meat and meat products used by the men.

In the United States Army no adequate preparation was made to insure a veterinary service to meet a crisis such as the country now faces although since the time of Abraham Lincoln veterinarians were attached to regiments of cavalry and field artillery. The army was very small. Indeed in a European sense it was not an army at all, but a national constabulary, split up into small, agile units whose problem it was to protect the frontier settlers against the encroachments and ravages of hostile Indian tribes or white renegades. Except for the Spanish-American war, which was successfully adjudicated by a few volunteers, our country seems not to have felt the need of an army. The profession of the soldier was looked upon askance by the people who felt comfortably secure on account of our apparently fortunate geographical location away from close contact with the principal nations of the earth.

The veterinarians in the old service, attached to mobile organizations and remount stations, served as regimental officers

*Read at the 10th Veterinary Conference at Ithaca, N. Y., Jan. 11, 1918.

only. Until recently they were refused that absolute essential to getting things done in the military-rank. They were neither commissioned officers nor enlisted men, soldiers nor civilians, "fish nor fowl". Not until after the Spanish-American war did they wear a uniform. There was no organization, nothing but a group of professional men each of whom bore about the same relationship to the military outfit to which he was attached that the family physician does to his clientele. In not a few instances the veterinarian, paid by the Government to keep the public animals healthy and efficient, found his function usurped by some commanding officer who had received a smattering of "hippology" while pursuing his curriculum at the United States Military Academy. Obviously, without military rank and with no authority beyond that granted by a commanding officer, the veterinary service was limited to last resort treatment of the sick and injured and little, if any, effort directed toward disease prevention, the real function of an army veterinary officer.

The mobility of an army depends upon its slowest unit. The rapidity with which a convoyed fleet of ships crosses the Atlantic is measured by the speed of its slowest vessel. Under the method of doing things veterinary in our army, the sick and injured remained with the mobile units, impeding their progress and reducing their efficiency as a fighting force, a mechanism, which sufficed during a reign of Peace that contemplated no adequate preparedness.

In 1916, Congress passed an act which provided that there should be established in the Medical Department of the Army a veterinary corps, granting to veterinarians commissions as officers with rank up to and including that of Major. Just why this corps was not organized as an autonomous entity and made a separate department of the army, is largely due to a misconception of the true functions of such a corps. In civil life, and even at many of the land grant colleges, and in the state veterinary police services, veterinary medicine is considered merely an appendage to agriculture and too often dominated by misguided influences.

Placing the veterinary corps in the Medical Department was not without its compensation, for it threw it into the hands of a great man—Major General Gorgas, Surgeon General of the United States Army. General Gorgas, upon whose shoulders rested the responsibility which this legislation entailed, was quick to realize

the importance of an adequate veterinary service and the necessity for its proper organization. Among the one hundred veterinary officers in the old army none was available to undertake the work of completely organizing the veterinary corps along the most modern and approved lines. When the present crisis became imminent, which precipitated the immediate organizing of every branch of army service, the General, realizing the impossibility of organizing from within, felt called upon to enlist outside aid. Accordingly, the administrative heads of the veterinary departments of three great universities which had fostered higher veterinary education, were called to Washington to act as an advisory board and assist in organizing an efficient and adequate veterinary corps for the National Army. These men began work only last August. They soon realized that there was nothing in our own army veterinary service which could be used. It was, therefore, determined to canvass foreign armies, note what each offered in the way of veterinary service, and shape the plan of organization as the result of this study. It was soon decided that the best in this regard was offered by the English army. In the British Imperial army exists a veterinary corps, an autonomous entity, forming the most efficient and economical organization of its kind in the world. Its organization was the result of distressing experiences felt during the Boer War, which, like ours, was fought over seas, and during which the mortality among army animals was exceedingly great. The efficiency of the British corps is evidenced by the record it has made along the western front where the losses among public animals have averaged less than that of any other army and where each mobile unit is kept efficiently, adequately and economically horsed. Taking the British service as a model, the authorities were asked to authorize the creation of a personnel, and an organization to include the best offered by our allied veterinary services. After some delay, by general order, authority was granted to create a personnel which provided for one veterinary officer and sixteen enlisted men for each 400 public animals, placing the new veterinary corps on a percentage basis, as are the medical and dental corps of the army. The size of the corps will, therefore, be increased or decreased as the army is made larger or smaller.

Experience has shown that these percentages of officers and men respectively will supply adequately not only service in the field but also the administrative officers necessary for an effective organization.

The general order failed to allow the higher ranks asked for, viz: those of Colonel and Lieutenant Colonel. For reasons which need not be gone into at present the higher grades were denied. However, even with no higher grade available than that of Major a great step in advance was made, as without the order no grade beyond that of Second Lieutenant was open to either reserve officers or civilians. The number of men in the regular army was only about 140 of whom over 50% were inexperienced young fellows just out of college. The older men, some of them ranking as Majors, were neither numerous enough nor experienced in administrative work to perfect an efficient organization. Further, they have been commissioned officers only a little over a year.

To man the veterinary corps with experienced, educated, trained and thoroughly efficient men was a formidable task. Obviously we had to draw heavily from civil life. For this there was ample precedent. In the present medical corps of the British army 96% of the officers were civilians when England entered the war, and in the veterinary corps over 85%, a figure which will also closely apply in our own army. To select men of proper attainments for military service is even more difficult with us than with Great Britain where all veterinary schools are on the same high plane and the law regulating admission to veterinary practice is national and not "state". England was not afflicted with forty odd different varieties of veterinary practice acts with the resulting wide difference in the education and training of available veterinary surgeons. While the best standard in education, training and law may be as high in America as abroad, it is so vitiated by poorer standards that the general average in these regards is lower. By carefully combing the regular and reserve corps of the army and selecting the best from civil life it is hoped to make the commissioned personnel of our corps second to none. Needed are brains and administrative ability.

Besides the personnel a plan of organization was drafted, again using the English service as a model. This plan, which is contained in the Manual of the Veterinary Corps, has been finally approved. It provides a mechanism whereby all sick and inefficient animals will be promptly removed from the fighting lines and their contributory forces and placed under the supervision and care of the veterinary corps until they are again healthy and efficient when they are returned to the lines. To accomplish this end,

a radical departure from the old idea of treating the animal wherever found, veterinary officers and veterinary enlisted men, acting as first aid agents and inspectors, are stationed with the mobile organizations. The function of these officers is to pick out all sick and inefficient animals and send them to the rear where in adequately organized and equipped hospitals they receive medical or surgical treatment. Therefore in each division of troops, which numbers about 21,000 men and 7,000 animals, will be found twelve veterinary units, each consisting of one officer and five men. The duty of the unit is to keep the mobile organization to which it is attached unincumbered by such impediments as sick and injured animals, which can only interfere with the organization's mobility. In order that all of the sick and injured may be gathered together for transfer to the hospitals, in each division a so-called veterinary mobile section will be established. The mobile section will be manned by one officer, its commander, and thirty-five enlisted men. The duty of this personnel is not to treat animals but to evacuate them under proper escort to the veterinary hospitals along lines of communication or at the base.

The veterinary hospitals will number one for each two divisions, and each will have a capacity of from 1,000 to 3,000 patients. At the hospitals only will treatment be given except for first aid and such other treatment as will not affect the patient's mobility.

From the hospitals some of the patients will be sent to convalescent depots for rest and fattening. From the depots those again fit for service will be turned over to the remount for reissue to the lines. Obviously, not all patients will pass through the convalescent depots, some will go direct from the hospitals to the remount depots.

In our old service each remount depot had its own veterinary hospital and at this writing this vicious system still prevails. The remount depot is a mechanism designed to supply the army with healthy and efficient animals. To maintain within it a constant source of pollution, i. e., a hospital with its isolation corrals, etc., is obviously to defeat the very purpose of the remount. Our army has long since outlived the system of placing isolation hospitals in the center of recruit camps, and, once the danger of mixing the rotten with the sound fruit is appreciated, this old custom will cease to exist among the animals of the remount.

Under the remount hospital plan of treating animals the Boer

War was fought. In that war England lost 46% to 60% of the animals in army service. In the present war and under the new system of handling public animals this loss has been reduced to from 8% to 15%!

By the time a given horse or mule sees service at the front in France it will cost us approximately $600. To the original purchase price of nearly $200 must be added cost of feed, care and transportation plus the losses through disease and death on land and on sea. Further a much larger percentage than we think of the healthy horses and mules will not be found fit for severe military service, due to bad conformation, sex, senility, and infirmities not usually seriously considered in civil life. War is a very exacting and strenuous business.

I have attempted to give you a brief synopsis of what the veterinary advisory board with the Surgeon General of the Army has accomplished since last August. The board consisted of the following veterinarians: representing the University of Pennsylvania, Dr. C. J. Marshall and Dr. L. A. Klein; Cornell University, Dr. V. A. Moore, and Ohio State University, Dr. D. S. White. Cooperating with the board were Dr. J. R. Mohler, now Chief of the United States Bureau of Animal Industry; Dr. C. E. Cotton, Minneapolis, Minnesota, and Dr. S. E. Bennett of Chicago.

Of these men the name of Clarence J. Marshall should go down in veterinary history as the one who initiated the plan of organization. Having visited the western front during the summer of 1916, he became acquainted with the actual necessities of modern warfare, and the great military and economic importance of adequate veterinary service to a modern army. When his country entered the war, he was promptly "on the job", and as early as last April was using every effort to induce the United States Army to prepare its veterinary service to meet the emergency. Rising from a sick bed he threw his whole soul and might into the work, and with no thought of self and bearing for weeks his own expenses, he labored assiduously for the cause. Stemming the tide of jealous criticism, partisan politics and narrow-minded censure, he stood firmly at the wheel guiding the new army veterinary craft through more than one rock-bound channel into the harbor of achievement just as when a boy he piloted the old Penn. crew in many a boat race. To him, this great, big-hearted, natural leader of men, the George Washington of our new army veterinary service, all honor is due.

Among the non-professional friends who did yeoman service in ably assisting us were President W. O. Thompson of the Ohio State University, President Jacob Gould Schurman of Cornell University, Provost E. F. Smith of the University of Pennsylvania, and President Ray Pearson of Iowa State College. In many ways these eminent men rendered most tangible and effective evidence of their sincere interest especially in securing for us entry to the War Department's head. Our profession owes to each a debt of gratitude.

As an advisor the board was most fortunate during the latter days of its existence to have a representative of the British Army Veterinary Service at its elbow, a scholarly man who, while possessing the education, graces and polish of an English gentleman, can deliver a punch with the dynamic force of dynamite behind it; a man of twenty years active army service, a survivor of the Boer War, and one of the organizers of the present efficient British veterinary service—Lieutenant Colonel Aitken, D.S.O., A.V.D., B.I.A., whom I have brought along in the flesh so that he might serve to inspire others as he has us. To him more than to any other one man credit should be given for perfecting the details of our organization and bringing the plan into materialization. Without his aid it is doubtful if much beyond a "creditable effort" would have been accomplished. When the smoke and roar of the present chaos has passed, and the bright sun again shines upon a land of "Peace and Plenty", the name of Colonel Aitken will be to the military members of our profession what *Lafayette* is to the men of the line. The effect of his inspiration will not only make our profession greater but will help weld together for all time the English speaking branches of the Anglo-Saxon race.

As you may have noted, the War Department, after some delay, has granted practically what has been asked by the advisory board. The responsibility from now on must rest upon the shoulders of the veterinary profession of this country. In the language of the streets "it's up to us to make good". Can we do so? My answer is *yes*. To make the best of this opportunity, to render each of us every ounce of efficient service it is in his power to give, to carry the great responsibility our profession has ever been called upon to assume, to do anything to make the Veterinary Corps of the National Army an indispensable factor in securing that victory which must come to our armies, are tasks which will try the

soul of each member of the veterinary profession whether he be "doing his bit" in khaki or in civilian garb. This is not a war between armies but among armed nations. The organization behind the lines must be as efficient as of the army itself. If either fail, victory will not be ours.

ARMY HAS MORE THAN 344,000 ANIMALS AGAINST 66,145 WHEN WAR WAS DECLARED

When war was declared the strength of the United States Army in animals was 66,145; it is now more than 344,000.

The Remount Service which, on April 6, was a part of the Transportation Division of the Quartermaster General's office, consisted of one officer and four clerks in Washington, five remount depots where horses were received, and a personnel and purchasing organization in the field in proportion. The Veterinary Corps of the Surgeon General's office, which is responsible for the treatment of sick and injured animals, consisted of 64 officers and no enlisted personnel when the United States entered the war.

The Veterinary Corps faced the job of building up an organization of about 1,000 officers and 12,000 men recruited almost entirely from untrained men without military experience. The present strength of the Veterinary Corps is 1,000 officers, and enlisted men are being transferred at a rate which will soon bring it up to its full authorized strength.

Strength of Remount Service. The Remount Service had a similar task in securing personnel. Its present strength is about 300 officers and 11,000 enlisted men. In place of five remount depots it now has 34, for which plans had to be drawn, sites chosen, and construction of shelter, hospitals, storage buildings, unloading facilities, etc., done in the shortest possible time.

The greater proportion of deaths of animals in the army result from influenza, popularly known as "shipping fever", and its complications. British losses on all horses purchased in this country during the war have been about 10%, counting only deaths occurring in this country. French and Italian losses have been higher. Up to the present no satisfactory medical treatment or preventive inoculation has been found for the disease called "shipping fever", and reliance must, therefore, be placed in gen-

eral sanitary measures and proper measures for the care and comfort of sick animals.

NUMBER LOST BY DEATH. The number of horses and mules lost by death at cantonments, auxiliary remount depots, purchasing depots, and embarkation depots during each of the last six weeks, for which complete reports have been received, with the percentage which this loss represents and the money loss on an estimated average purchase cost of $175 per animal, are given in the following table:

Week ending—	No. of deaths	Weekly per cent	Cost	Animal strength reported
Dec. 8.....	1,034	0.52	$180,950	197,436
Dec. 15.....	961	.44	168,175	213,803
Dec. 22.....	823	.37	144,025	221,451
Dec. 29.....	674	.28	117,950	231,614
Jan. 5.....	672	.27	117,600	244,357
Jan. 12.....	613	.24	107,275	249,895
For six weeks....	4,777	*.35	$835,975	*223,093

*Average

Seven principal steps have been taken to reduce the losses by death, and are considered to account for the improvement to be seen in the weekly reports. These are:

1. Completion of facilities at remount depots.
2. Increasing the efficiency of remount and veterinary personnel.
3. Increasing the supply of veterinary medicines.
4. Establishment of animal hospitals at railroad centers en route.
5. Districting of the country and assignment of veterinary inspectors for all remount depots, yards, stables, etc., for prevention of infection.
6. Stationing at most important unloading yards of veterinary officers to keep yards in sanitary condition and to inspect all shipments passing through for the segregation, holding over, and treatment until cured of all sick animals.
7. Securing the cooperation of the Bureau of Animal Industry in superintending the cleaning and disinfecting of yards, stables, and stock cars used by contractors furnishing animals to the War Department.—Official Bulletin.

ENLISTMENT

MEMORANDUM. Authority has been granted for the enlistment of 2000 specially selected men for the Enlisted Veterinary Corps, National Army. These men must not be subject to the selective draft. Men from 18 to 21 and from 30 to 40 years of age are eligible for enlistment. They will be assigned to duty in Veterinary hospitals and for other purposes in the Enlisted Veterinary Corps, National Army. Service overseas can be expected shortly. The following classes of men are desired: veterinary students; agricultural students; farmers; stablemen, and other men accustomed to handling horses.

A few men of the following occupations will also be accepted: horseshoers, saddlers, pharmacists, cooks, typists or stenographers.

All men are enlisted as privates, but at present there are exceptional opportunities for advancement to the grade of non-commissioned officer. The following are the rates of pay:

GRADE	MONTHLY PAY
Sergeant, 1st Class	$56.00
Sergeants	44.00
Corporals	36.00
Farriers	36.00
Horseshoers	38.00
Saddlers	36.00
Cooks	38.00
Privates, 1st Class	33.00
Privates	30.00

In addition to the foregoing pay enlisted men are furnished with food, clothing, quarters, medical and dental attendance without cost.

Application for enlistment can be made at any U. S. Army recruiting office, and applicant should state that he desires to enlist in the Veterinary Corps, National Army.

HORSES IN THE GREAT WAR

There are 4,500,000 horses engaged in this war.

On the Western front the losses have averaged 47,000 horses a month.

In eight hours' fighting along a three-mile front at Verdun the French lost 5,011 horses.

Over a million-and-a-half of America's horses have been purchased for service with the Allies.

In the first seven months of 1917 the value of horses shipped to Europe from American ports was $25,327,333.

For the month of July alone the value was $1,377,202. Wastage of horses means an enormous money loss, which mere money cannot now replace. Thirty-three thousand horses have died in America while awaiting shipment and 6,000 have died at sea in course of transit.

In nine weeks the British captured 332 German field and heavy guns and lost none. The German losses are partly due to lack of horses.

America, with an army of 2,300,000 men, will require 750,000 horses to begin with, and shipload after shipload to keep the force up to the strength. The total need will exceed a million a year under fighting conditions, and may even be vastly greater.—*Rider and Driver.*

—The following veterinarians have received commissions as Majors in the Veterinary Corps, National Army, and have been assigned as follows:

Major J. H. Blattenberg, Fort Sam Houston, Texas.

Major W. Reed Blair, Camp Lee, Petersburg, Va.

Major C. E. Clayton, Camp Greene, Charlotte, N. C.

Major E. B. Ackerman, Camp Greenleaf, Fort Oglethorpe, Ga.

Major S. H. Gilliland, 39th and Woodland Ave., Philadelphia, Pa.

Major G. B. McKillip, Camp Upton, Yap Hank, L. I., N. Y.

Major D. H. Udall, Camp Greenleaf, Fort Oglethorpe, Ga.

—Lieutenant Harry B. Roshon, V.R.C., formerly of Reading, Pa., is with the 59th U. S. Infantry, Camp Greene, Charlotte, N. C.

—Lieutenant H. E. Torgersen, V.C.N.A., is stationed at Fort Douglas, Utah.

—Lieutenant Jos. F. Crosby is stationed at the Remount Depot, Camp Sevier, Greenville, S. C.

—Lieutenant C. M. Stull has been relieved from his duties at Presidio, Texas, with the 8th Cavalry and ordered to report to the Commander of the El Paso district for duty at the Auxiliary Remount at Fort Bliss, Texas.

—Dr. H. L. Brawner of Livingston, Mont., has received a commission in the Veterinary Reserve Corps.

—Lieutenant Louis Griessman, V.R.C., is with the 302d Ammunition Train at Camp Upton, L. I., N. Y.

—Captain Charles H. Jewell, formerly at Honolulu, H. T., is now Division Veterinarian with the 80th Division at Camp Lee, Petersburg, Va.

—Major Henry W. Peter, formerly at Del Rio, Texas, is now stationed at Camp Shelby, Hattiesburg, Miss.

—Captain R. A. Greenwood, formerly at Painesville, O., is now stationed with the 105th Engineers at Camp Sevier, Greenville, S. C.

—First Lieutenant Seth C. Dildine, formerly of Chicago, Ill., is now stationed at Auxiliary Remount Depot No. 319 at Louisville, Kentucky.

—Tick Eradication in Louisiana. The organization which during 1918 will likely rid the state of the cattle tick has been perfected. Thirteen additional federal veterinary inspectors have just arrived on the scene and Drs. E. I. Smith and E. P. Flower, federal and state representatives, respectively, have made practically all arrangements for a state-wide fight against the fever tick, beginning April 1.

With a federal inspector directing the work in each parish, assisted by state inspectors who will see that the state compulsory dipping law is enforced, it is believed the entire state may be freed of ticks and released from quarantine by next winter.

Forty-seven of the 50 parishes in which systematic tick eradication will be carried on this year have about completed building vats and secured chemicals for the dipping solution.

The work may not be well under way in each parish until about March 15, Dr. Smith has announced. The federal government spent $110,000 in Louisiana last year in tick eradication. Considerable more will be spent this year. The federal government expends about $3 to each $1 the state puts up.

Dr. Flower has made arrangements for the necessary funds to carry on the work until the legislature meets in May when a special appropriation will be sought.

AMERICAN VETERINARY MEDICAL ASSOCIATION

CHAIRMAN'S ADDRESS

Section on College Faculties and Examining Boards

M. Jacob, Knoxville, Tenn.

In presiding over this meeting and studying its affairs, it appears we are occupying a rather peculiar position, in so far that our function today is dual in its representation. We meet as the Association of Veterinary Faculties and Examining Boards of North America and at the same time represent the Section on Veterinary Colleges and Examining Boards of the American Veterinary Medical Association, this of course as per agreement last year, following the adoption of the new constitution. However, no matter what our affiliations may be, there are many problems bearing on the veterinary profession which need an earnest consideration on the part of this section. As in almost every other line of human endeavor, circumstances have arisen bringing about a new order of things and we as a profession are being called upon to do our part toward the solution. The other sections of the A. V. M. A. have important duties to perform, but equally as important are those which rightfully belong to this section, although the tendency has been to overlook, or rather minimize the real needs of the profession from the standpoint of an organization having as its paramount object the betterment of our educational system.

There are men in the profession who have been untiring in their efforts to impress the real function of this association and to point out the medium through which the interests of the profession might best be served, but I regret to admit that as yet these efforts have been largely in vain. I say this for the reason that my own observations have clearly indicated to me that this association has had neither the financial nor moral support which it has deserved. To an extent this can be accounted for by the fact that its activities have included principally members of veterinary faculties and examining boards, leaving the erroneous impression that it bears little interest to the veterinarian outside of this rather limited realm. It is evident the true function of this association has never been thoroughly understood, consequently it has failed in its full purpose, and in order that we may command future support we must adopt such measures as will insure to the profession

a solution of those problems which, as I have already stated, belong to an organization or section of this kind. At present we still exist as a partly independent association, but at the same time the American Veterinary Medical Association has offered an inducement by having a new constitution, which in its operation includes a section on Veterinary Colleges and Examining Boards, and if this association were to remain intact would mean a duplication of work.

The solution of this, as it appeals to me, is for the A. V. M. A. to absorb the Association of Veterinary Faculties and Examining Boards, thereby converting what has been a weakling in the eyes of the profession into an important part of the strongest veterinary organization in the world. Before our official acts bring this into reality there is an important matter to which we must first give due consideration. As it is, members of State Examining Boards are eligible for membership to this association but at the same time may not be eligible to membership in the A. V. M. A., and unless I am incorrectly informed there are several such cases at this time. Shall it be decided to refuse recognition to those men or shall we adopt a measure giving partial or complete recognition? This should be thought over carefully and acted upon during this meeting.

Adopting the sectional plan in the A. V. M. A., as already outlined, is not by any means a one-sided affair as our first thought might lead us to believe. While it is generally agreed that the work of this association will be materially benefited, is it not a fact that the A. V. M. A. is also strengthened? In the past many questions bearing on some phase of our veterinary educational system have had no real place on the program, but under the reorganization these things are provided for and means a more useful organization.

For several years I have felt that many undesirable conditions involving our educational system could have been overcome more readily if discussed before a strongly organized body, and while we have missed these opportunities in the past, those of the future should be able to serve a greater purpose.

There is at this time a popular demand for greater efficiency and this is as it should be in order that we may properly meet modern conditions. However, we should bear in mind that the evidence of this greater efficiency must be conveyed to the public at

large through these men who are in every day contact with the practical side of the veterinary profession, so it means we must produce men who are capable of meeting conditions as they occur, whether in practice, research or regulatory work. It cannot be denied that the solution of this problem lies in the possibility of our veterinary schools graduating men who are properly qualified, and if this is so, the school becomes the all-important factor and as the efficiency of the school is developed, so will be the veterinary profession.

Considering the true purpose of this section, I believe it the duty of our organization to use its every legitimate influence toward the betterment of American veterinary institutions. It is true, much has already been done, but we are not yet up to the pinnacle of perfection so far as it concerns the rank and file of our schools. Of course you could investigate any recognized veterinary school in America and probably find some one or more highly commendable features, but so many are strong in one thing and weak in another. Some may argue that no institution is strong in all its branches and admitting that such might be the case it is far from that which should be our standard. Veterinary schools should be strong throughout, at least to such an extent so that the graduate may be efficient in a general way. We realize fully that the tendencies of the students are far from uniform, but the school determines that after and not before matriculation, consequently its duty is to offer a course acceptable to the student no matter what his subsequent scientific or professional inclinations might be and he will then at least have a proper basis for future development.

It would appear presumptuous on my part to attempt a complete discussion on school development, but there is one phase which I will take the liberty to discuss, namely, the veterinary faculty, and what I may say is applicable to both state and private institutions.

The selection of veterinary faculty members is too often a matter of convenience, the financial situation being such that it requires the filling of lecture or laboratory periods at the least possible cost. Again, men have been selected on the strength of a reputation along some special line of work, but those same individuals, if their every other side were fully considered, would be found lacking. Such conditions are bound to force discredit upon educa-

tional institutions. Too often we find recent graduates from recognized schools who are extremely deficient in certain well established lines of work, which causes us to wonder on what basis it was possible for him to obtain his diploma. For example, it is a frequent occurrence to see a bunglesome mess made of the tuberculin test in even its ordinary application. Now, then, is this recent graduate in all instances the one to be censured for this apparent incompetence? In my opinion, if we analyze such cases we will find too often that the trouble lies with the teacher and not the student. When one is identified with regulatory work conditions are frequently observed which bring this matter forcibly to mind.

A professorship in a veterinary school has not always meant what it should and I firmly believe that requirements for higher standards in the distribution of these titles would accomplish about as much and have the same influence on our teaching force as have higher entrance requirements on the student body. I will not go into details regarding qualifications for teachers, but will summarize as follows:

1. Sufficient training to justify recognition in a teaching capacity and preferably to include premedical education.

2. Sufficient laboratory, hospital and field experience; for example, a man is not sufficiently qualified to do justice to the chair of practice who has not had at least five years' experience in general practice in addition to his every other training.

3. Real teaching power, meaning by that the ability of conveying information to the student.

4. Acceptable personality, carrying with it high ideals along moral and professional lines. The impression of faculty members on the student should be pronounced and the school is obligated to offer environments essential to the production of high ideals. I have seen faculty members knowingly and wilfully resort to unethical and unprofessional tactics, yet were able to hold their position as teachers.

5. Progressive interest in work. No man can do justice to his chair unless his work carries a broad and progressive interest for both his profession and the community at large, the coefficient of which is self sacrifice on his part.

As a general condition I am inclined to believe that the veterinary schools of Europe possess greater efficiency in the appli-

cation of their course and is largely accounted for by the personnel of the teaching forces. It should be plain to everyone interested in the development of the veterinary profession that the future possibilities of the American veterinarian are in direct proportion to the development of our faculties and I can see no greater function for this association than to use its influence in this direction. Furthermore, by this means we automatically develop the personnel and simplify the operation of our state examining boards, which for several years has been the source of much deliberation before this association.

In conclusion I wish to thank those who have given their assistance toward the conduct of this meeting and especially the secretary, Dr. Wall, who has been active and untiring in its behalf. I am sure that the evolution of this association into a merited section of the American Veterinary Medical Association will mean bigger and better things for both the veterinary profession and the general public.

SECRETARY'S ADDRESS

Section on College Faculties and Examining Boards

Robert D. Wall, Des Moines, Ia.

My report will necessarily be rather brief, owing to the fact that I was elected secretary just prior to the close of the Detroit meeting, and as it had not been my pleasure to participate in the affairs of the association prior to that time I was not acquainted with the affairs of the association.

There were notes made by a public stenographer at the Detroit meeting, but as none of the papers was available, I did not deem it advisable to take up the typewritten notes, which would have cost the association in the neighborhood of fifty dollars.

As those who have been in touch with the activities of this association know, its object is to standardize courses and teaching methods in colleges and to obtain as great a degree of uniformity in examinations by state boards as will be permitted under the laws of the various states.

The various methods of examining used by the state boards were gone over quite thoroughly, some boards favoring oral examinations and others the written form. It was found that the

written examination made a better record and was the most practical where a number of candidates were present for examination. The draft of classification of subjects, submitted by Drs. Babson and Maloney, and printed in the abridged report of the 22nd annual session held at Oakland, was gone over and several changes were recommended by Dr. Klein and others. It was suggested that a committee be appointed to amend the above report. The president appointed a committee for this purpose consisting of Drs. L. A. Klein, C. C. Mix, G. A. Roberts and Robt. D. Wall, with instructions to report as soon as the revision could be made. The following report was accordingly submitted by this committee at a later session of the Detroit meeting:

"We recommend that that portion of the report submitted by Drs. Maloney and Babson, issued in the report of the Oakland meeting, referring to the grouping of subjects in which examinations are to be held and the weights to be allowed for each group be amended to read as follows:

Hygiene	General hygiene Milk hygiene Meat hygiene Sanitary science	15%	2½ hours
Anatomy and Physiology	Anatomy Histology Zoology Physiology Embryology	15%	2½ hours
Pathology and Laboratory Diagnosis	Pathology Bacteriology Parasitology Urine analysis	15%	2½ hours
Materia Medica and Therapeutics	Materia Medica Biological products Toxicology Physics and Chemistry Pharmacology	15%	2½ hours
Diagnosis and Practice	Sporadic diseases Transmissable diseases Zootechnics	20%	2½ hours
Surgery and Obstetrics	Surgery Obstetrics Dentistry Control and restraint	20%	2½ hours

Seventy per cent of total weights are necessary to pass for registration, but in no case shall the grade be less than fifty per cent in any group. Each question should be marked on a scale of 0 to 100. The average marks given equals the percentage of weight in each general division.

We further recommend that these groups of subjects and weights be adopted by all examining boards as a guide and put into operation as soon as possible in so far as the laws under which they are operating will permit.

In cases where the law specifies certain subjects in which examinations must be given other subjects, which are included in this list, and not mentioned in the law, may be sometimes included in the examination. For example, under the head of Theory and Practice, questions on pathology, parasitology and physiology might be asked and under the head of surgery questions in regional anatomy may be included, under materia medica, questions in toxicology and also, if desired, questions regarding poisonous plants.

It is the opinion of the committee that a great deal of the confusion existing at present among college faculties and examining boards, in regard to ground covered by the questions in the various subjects in which examinations are given by state boards could be overcome by the board using the text books standard at the time as a basis for framing questions. We also believe that this confusion could be further reduced by the examination questions of each board being submitted for the approval of the entire membership of the individual board.

The committee does not feel that it has sufficient time to properly consider the question of uniform grading of examination papers and practical examinations, although it regards both as very important.

And that section five of the proposed law, as suggested by Maloney and Babson be amended accordingly."

(Signed) C. C. Mix, Robt. D. Wall,
G. A. Roberts, L. A. Klein.

The above report was accepted by the association and the committee instructed to report further regarding the question of oral and written examinations at the 1917 meeting.

The question of time allotted for examinations brought out the fact that the nature of the questions would materially affect this phase, and also that some boards were more or less unfair, depending on the individual examiner or the text from which questions may have been framed; in the latter case, however, it was the unanimous opinion of the association that only standard text books or works should be used as a basis for framing questions and should the candidate present an answer in accordance with any standard work he should be given due credit.

It was moved that the president appoint a committee to draft a number of questions under the various heads to be used as a guide in framing proper questions by state boards. Accordingly the president appointed a committee for this purpose composed of Drs. Stewart (Chairman), Mo; Babson, Mass.; Sallade, Pa.; Goodwin, La., and Seeley, Wash., with instructions to draft a sample set of questions to be furnished the various state boards.

Dr. Hoskins offered the following resolution:

Be it resolved by this association that only graduates of such colleges as are now recognized by the Bureau of Animal Industry, U. S. Dept. of Agriculture, be recognized by state examining boards and that after the first of September, 1917, only colleges maintaining a standard four-year course should be recognized.

Above resolution adopted.

At the Detroit meeting Dr. S. Stewart appeared before the finance committee of the American Veterinary Medical Association with a view of a more definite cooperation and support of that association. It is my understanding that the association could not render financial aid unless this association was made a part of the American Association and accordingly it was moved to adopt this association as a distinct branch of the American Veterinary Medical Association, and for the purpose of liquidating certain expenses of the Association of Veterinary College Faculties and Examining Boards a fund of one hundred dollars was provided.

I do not believe there is a clear understanding as to the terms or extent of affiliation with the American Association or to what extent the members of this association can cooperate with the American Association and believe it would be well to have this matter definitely arranged at this meeting.

ASSOCIATION MEETINGS

SOUTHEASTERN STATES VETERINARY MEDICAL ASSOCIATION

Second Annual Meeting

Hotel Patten, Chattanooga, Tenn., December 27-29, 1917

The first session was well attended by veterinarians from Tennessee, Georgia, Alabama, Mississippi, North and South Carolina and Florida. Likewise, the attendance continued good until the very last of the program ending in a well selected clinic held at the base veterinary hospital, Fort Oglethorpe.

The sessions of the association were presided over by President C. A. Cary. The first session opened by prayer by Rev. W. T. Bartlett of Chattanooga.

A warm address of welcome was given by Mr. Pound of the Hotel Patten. A few choice words of response were made by Dr. F. P. Caughman of Columbia, S. C.

The first paper on the program was that of Food and Drug Inspections, by Mr. H. L. Eskew, State Food Commissioner of Tennessee. The speaker elaborated quite largely upon meat inspection and deplored the fact that his department was not represented by a veterinarian on it; that few inspections in the state were being made by veterinarians and that there was a sad lack of state laws to assure better inspection. The paper was discussed by several members present. Dr. Bahnsen, State Veterinarian of Georgia, reported that the meat inspection service in Georgia was under the offices of the state veterinarian instead of under the food and drug department as in Tennessee.

Dr. C. A. Cary next delivered his presidential address. He made mention of the following subjects: the lack of harmony existing between veterinarians, and their petty squabbles existing among practitioners and among veterinarians in official positions. He dwelt somewhat at length upon the veterinarian and the veterinary organization in the army. The American Veterinary Medical Association came in for its share of mild censure in its lack of consideration of the South and the southern veterinarian. Tick eradication, accredited tuberculosis-free herds, hog cholera, black leg and anthrax were subjects receiving commendation and need of the veterinarian's hearty support.

The president's address was taken exception to in a few in-

stances by Dr. N. S. Mayo, who discussed some of the points in the address more or less in detail.

Among the most interesting and instructive features of the program was the Education of the Veterinarian from the Farmer's Viewpoint, by Dr. Tait Butler. He laid emphasis upon the fact that, as never before, the veterinarian needed a good training along animal husbandry lines and the more general information he had upon farming in general, the more nearly he would come in fulfilling his mission and in gaining the confidence of his clients.

Important Considerations in the Control of Hog Cholera was discussed by Dr. Robert Jay, federal hog cholera expert in Tennessee. The paper dealt with a number of experiments in showing some of the means of transmission of cholera and in the need of using both sanitary measures and anti-hog cholera serum in the control of outbreaks. In the discussion which followed, Dr. Jacob, State Veterinarian of Tennessee, stated that in Tennessee serum injections were made only by veterinarians.

Our Observations on Treatment of Infectious Abortion in Cattle was quite extensively dealt with by Dr. H. Jensen of Jensen-Salsbery Laboratories. He reported that in carefully outlined experiments and collected data the use of abortion bacterins (dead cultures) had apparently materially decreased the abortions and their consequences in those animals treated.

The evening of the first day was delightfully spent at a theatre party, the kindness of Dr. F. W. Morgan, the local veterinarian.

Dr. H. C. Hutchens, Assistant State Veterinarian of Georgia, gave some most useful information in his paper on the Necessity for Municipal Abattoirs and State Slaughter House and Meat Inspections. He gave a number of concrete illustrations of what the number of municipalities were doing in this line. This paper was discussed more or less in detail by Dr. C. A. Cary, who, by the use of a blackboard, illustrated the type of abattoir used at Auburn, Alabama.

Dr. H. K. Wright of the Mulford Laboratories discussed more or less in detail the work of the English Commission on Infectious Abortion and their conclusions. From their observations, he was inclined to think that better results might be obtained from using living cultures of *B. abortus* than of bacterins.

Dr. William M. Bell of Nashville exhibited many unique instruments which he and his brother had manufactured, improving

and simplifying many operations by the use of the same. The one creating most attention was a large hog cholera syringe with a double barrel, one inside of the other. The outer serving as a container and the inner as a syringe which was filled from the container without exposing the serum. Except for its size, it seemed to be very practical.

The Veterinary Profession and Pathology was discussed by Dr. W. H. Cheney, M.D., of Chattanooga. His paper consisted largely of showing the need for positive diagnosis, in many cases requiring laboratory examinations, and in complimenting the veterinary profession on its representative association and its keeping so well abreast of the times.

The subject of Blackleg and Its Differentiation from Anthrax, Hemorrhagic Septicemia and Malignant Edema was interestingly presented by Dr. W. A. Johnson of the Purity Biological Laboratories. He reported excellent results being followed by the use of blackleg serum and aggressin.

A round table discussion was most enthusiastically conducted by Dr. H. Jensen. The subjects calling for most discussion were internal parasites and so-called black tongue in dogs. The latter resulted in the appointment of a committee to find and report a suitable name for this common affection of dogs in the South. The committee appointed consists of Drs. Major Schofield, Moses Jacob and F. P. Caughman.

Twenty-five new members were recommended by the credentials committee and were elected to membership in the association, making the total membership 125.

Birmingham, Ala., was selected as the next place for meeting February 20, 21 and 22, 1919.

The resolutions committee presented the following resolutions:

Thanks to the hotel and newspapers.

Respects to Mrs. A. D. Melvin and family.

Respects to Mrs. B. O. Minge and family.

Approval of accredited tuberculosis-free herds.

Deploring the tendency to slaughter prematurely meat producing animals.

Congratulations and assurance of hearty cooperation to Chief J. R. Mohler.

Thanks to Dr. F. W. Morgan for his untiring efforts in making the association pleased with its visit to Chattanooga.

To urgently invite the A. V. M. A. to the South for its 1919 meeting. The association modified the resolution to make the place of meeting New Orleans.

The following officers were elected for the ensuing year:

President, Dr. F. W. Morgan, Chattanooga, Tenn.; first vice president, Dr. F. P. Caughman, Columbia, S. C.; second vice president, Dr. J. S. Andrade, Huntsville, Ala.; third vice president, Dr. Major Schofield, Miami, Fla.; secretary-treasurer, Dr. G. A. Roberts, Raleigh, N. C.

Resident secretaries: Alabama, Dr. C. A. Cary; Florida, Dr. Major Schofield; Georgia, Dr. H. C. Hutchens; Mississippi, Dr. W. L. Stroupe; North Carolina, Dr. A. C. Jones; South Carolina, Dr. M. R. Blackstock; Tennessee, Dr. F. R. Youree.

Appointments on executive committee: Dr. Peter Bahnsen, Dr. W. G. Shaw.

Following the day's program, a most happy climax was reached in a sumptuous and enjoyable banquet with Dr. H. Jensen acting as toastmaster.

The last day was occupied in a well planned clinic at the Veterinary Base Hospital at Fort Oglethorpe and in visiting various points of interest about Chattanooga.

Resolutions Adopted

The Southeastern Veterinary Medical Association indorses the establishment of state and federal accredited tuberculosis-free herds as one of the most logical and progressive steps in the control of bovine tuberculosis.

This association desires to encourage all breeders of pure-bred cattle to secure from state and federal government this recognition of their herds. We also bespeak for state and federal officials the generous and unselfish support of all practicing veterinarians in the establishment of such tuberculosis-free herds.

Peter F. Bahnsen, W. G. Shaw.

The world's crisis has created an extraordinary shortage in food producing animals. Patriotism and good business demand meat and milk production on a far greater scale than ever before in our history.

Not only production needs to be stimulated, but the present crisis demands greater conservation of our resources than in the past.

The members of this association recognize the emergency and hereby pledge themselves to loyally support the administration to foster increased production and stimulate conservation of our live stock resources.

We deplore the tendency to slaughter food producing animals prematurely and pledge ourselves to personally discourage this practice.

PETER F. BAHNSEN, W. G. SHAW.

WHEREAS, The A. V. M. A. has held only one meeting out of fifty-four in the South, and

WHEREAS, Many of the profession in the South have not been permitted to attend meetings of the A. V. M. A. and obtain the knowledge, social and professional uplift therefrom, and

WHEREAS, The live stock industry and work of the veterinarian are growing into national importance; therefore, be it

Resolved, That the A. V. M. A. be requested and urged to meet in 1919 in the City of New Orleans.

W. G. SHAW, W. G. INGRAM, PETER F. BAHNSEN,
Committee on Resolutions.
G. A. ROBERTS, Sec.-Treas.

VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY

PRESIDENT'S ADDRESS*

J. PAYNE LOWE

During the lifetime of this association, our profession has had a rough and rugged road to travel, in many instances beset with danger, but I can say without fear of contradiction that this organization has been in the past and will continue to be in the future, an important factor in our professional advancement.

I need not mention the names of those who for years have been "bulwarks of strength" among us. Suffice to say that their work has been one of service and they are entitled to the gratitude of us all. I am a firm believer in organization. The young men in our ranks I particularly want to enthuse to become associationists. After graduation and upon receiving your license and recognition

*Presented at the Annual Meeting of the Veterinary Medical Association of New Jersey, held at Paterson, on January 10, 1918.

from the state, you are entitled to all the privileges and immunities of our profession, and in return you are in honor bound to do "your bit". From an educational and scientific standpoint you should be enlightened and broadened. Here professional and scientific subjects should be candidly discussed. The association should be the "melting pot" of the profession. From a social and fraternal standpoint of fellowship their discussions should enlighten the perplexing duties that arise in the performance of our daily problems. It should tend to bring forth uniformity of knowledge and singleness of purpose and from this association, through its members, should emanate and be given to the people of our state, all the veterinary profession has to offer.

This association should frequently send delegates to other organizations having things in common with us. These visitations should always be in the spirit of cooperation, never in the spirit of antagonism. This will teach us to see problems in their true proportions and get the other fellow's viewpoint.

During the past year important recognition has been given to our profession. At last a veterinarian, Doctor J. H. McNeil, has been appointed Chief of the Bureau of Animal Industry of the State Department of Agriculture. Doctor McNeil is to be congratulated. Our profession is recognized and the state will derive the benefit of veterinary direction. Every veterinarian should be not only ethical, but loyal, and report all reportable diseases and otherwise assist the department in a constructive way.

Our country, being in the throes of war, has awakened the people to a realization that agriculture and animal husbandry must be fostered to a greater degree than ever before and that the veterinary profession must not only protect our live stock so far as possible from the ravages of disease but must point the way scientifically to breed the best types of the various domestic animals and further advise and cooperate with breeders as to the proper environment, care, etc., of them.

New Jersey, from the density of her population, with her relatively small area, her geographical location, her many bridges, ferries, steamboat lines not ferries, public highways and numerous railroads entering, traversing and having their terminals within the state, make her particularly exposed and renders the supervision and control of communicable animal diseases a most complex problem. Again the intensity of the dairy industry and the

fundamentally wrong environment of the dairy cow, especially in the northern part of the state, adds difficulties. Yet with all these difficulties and the lack at that time of a properly organized State Bureau of Animal Industry, New Jersey succeeded in doing her part well and stamping out the recent outbreak of foot-and-mouth disease in conjunction with the U. S. Bureau of Animal Industry.

Our state requires the tuberculin testing and the slaughtering of reactors of all dairy and breeding cattle imported into this state. This is all right as far as it goes, but with this alone we can never expect to make any appreciable inroads in the control or suppression of bovine tuberculosis. Our state should assist and act in conjunction with the plan inaugurated by the U. S. Bureau of Animal Industry. Our cattle dealers and live stock men should be made acquainted with this government plan and should be encouraged and advised to buy from "Tuberculosis Accredited Herds". Animals so certified by the U. S. Bureau should be admitted into our state without any further requirements so far as tuberculosis is concerned. It is my opinion that all cattle with the above exception should be subjected to the tuberculin test after their arrival into this state. This would be an indirect way of forcing the dealers to buy from accredited herds. All of this will be of little or no avail, however, unless there is exercised a broad, intelligent and rational supervision of this disease within our state. I say rational because conservation is the watchword of the hour and it will not do to indiscriminately kill every reacting cow, even if the state is willing to pay for her, which is very doubtful. Further, there is no need to cry "mad dog", but we might as well call a spade a spade and admit of the too general prevalence of this disease in our herds. In Volume I, No. 10, of Public Health News "Pasteurization Number" issued by the State Department of Health, it is stated that "there are ninety-five pasteurizing plants in the state, distributed among seventeen of the twenty-one counties. It is estimated that 780,000 quarts of milk are produced daily in the state of which amount approximately 31% is pasteurized and that present day tendencies indicate that the proportion of milk which will be pasteurized within the next five years will greatly exceed that which is now so treated." If this is a fact, then there is no need and it would be a great economic waste to slaughter the "Tubercular Reacting Cow", providing she shows

no physical evidence of disease and is otherwise a fit dairy animal.

I am not advocating or opposing pasteurization. Much can be said both pro and con regarding it. Those intrusted with the supervision of our milk supply should begin with a healthy cow, maintained and cared for under conditions that do not oppose physiological laws, always supplemented by clean methods of handling and proper refrigeration of the milk. The only justification for pasteurization of milk is to destroy pathogenic bacteria.

In order to effectuate a plan to control and stamp out bovine tuberculosis in our state it would be necessary to inaugurate a complete and systematic plan of tuberculin testing. Laws should be enacted which would not only compel the veterinarian making the test to report all reactors to the state but which would compel the permanent branding of all such animals. The buying and selling of such animals within the state should be allowed so long as there was no deception practised and they were sold as reactors. "Water seeks its level" and these branded reacting animals would seek their level and bring their true value in the market. The proprietor of a dairy pasteurizing its entire output of milk would soon pay the dairy value for such an animal. This method would segregate our herds into two classes, each of which could be designated by an appropriate appellation.

I believe that the state should exercise some supervision over the erection of dairy buildings. If committees were appointed by the organizations which represent the various interests concerned and these committees concurred they could make recommendations for "standardizing the dairy barn". In reference to light, ventilation, air space, drainage, etc., plans and specifications should be available for those intending to build. One of the essential things in dairy barn construction is to have a building so constructed that it can with reasonable effort be thoroughly disinfected. There are many dairy buildings so constructed that it is well nigh impossible to disinfect them.

The authorities should require the observance from the owner of every dairy establishment, a day to be known as "Disinfection Day" at which time dairy premises should be thoroughly disinfected according to methods approved by the state. Disinfection of dairy buildings at proper intervals is a very important factor in controlling tuberculosis. Every dairy barn should have attached thereto a commodious, properly protected and well drained

barnyard where the cows could have at least passive exercise. It is unscientific and impractical to lessen the vitality and resisting power of a dairy cow by keeping her confined in a stanchion during her entire milking period, using the argument that she will produce more milk. This may be so in many cases but conversely it is also true that this is often a factor in causing her to go wrong in her milk. A presidential address is not the place to go deeply into scientific subjects and I have, therefore, only touched some of the high spots in a practical way.

Our state is contemplating the building of state-wide highways with the thought of ultimately connecting with New York and Pennsylvania. This will be an advantage to various states and particularly to New Jersey. Is it not well to anticipate at this point the conservation of the horse? In the last analysis the horse still holds an important place in mixed agriculture and if we are to continue to use him as one of the means of transportation, suitable provision should be made in the construction of these highways for his travel. Therefore, I not only suggest, but urge that this association at this time respectfully bring the governor's attention to the fact that the future welfare of the state is dependent to a considerable extent upon the preservation of the horse, and that this fact be considered in the construction of the proposed new highways.

Fraternally it is eminently proper at this time for this association to go on record as recognizing and appreciating the patriotic services that are being so unselfishly given by the following members of our association: Lieutenant M. A. Pierce, 10th Field Battalion, Little Silver, N. J.; Lieutenant Edward C. Conant, Fort Sam Houston, Texas; Lieutenant Harold V. Stearns, Front Royal, Remount Station, Va.; Lieutenant James L. Lindsay, Base Veterinary Hospital (somewhere in France); Lieutenant Peter F. Trainor, Camp Devens, Ayer, Mass.; Lieutenant T. F. O'Dea; Lieutenant Robt. H. Simms; Lieutenant Harry Ticehurst.

I would suggest that this association send fraternal greetings to these members. In conclusion I wish to thank the members for the honor they have bestowed in electing me president of this organization. It is a privilege to serve a profession that stands for so noble a cause; and, further, it has been a pleasure because of the support and hearty cooperation of the co-officers and members in general.

REPORT OF THE ANNUAL MEETING OF THE VETERINARY MEDICAL ASSOCIATION OF NEW JERSEY

The annual meeting of the Veterinary Medical Association of New Jersey was held on Thursday, Jan. 10th, 1918, at the United States Hotel, Paterson. The meeting was called to order at 11:15 A. M., by President J. Payne Lowe. In the absence of Secretary Loblein, Dr. R. W. Butterworth of Paterson was elected secretary pro tem.

The calling of the roll was dispensed with and the following members were recorded present: J. Payne Lowe, John B. Hopper, William Herbert Lowe, W. J. Reagan, Thomas E. Smith, R. A. Huff, Simeon Yetter, M. L. Plumer, John V. Finch, W. F. Reynolds, J. W. Haffer, W. F. Harrison, J. C. Peterson, H H. Bair, James McDonough, L. P. Hurley, Lieutenant O'Dea, R. W. Butterworth.

Visitors present: Lieutenant Martein, Hohokus Encampment, Hohokus, N. J.; J. H. McNeil, Bureau of Animal Industry, Trenton, N. J.; F. W. Munse, Trenton, N. J.; Professor W. Horace Hoskins, Dean New York State Veterinary College, New York City; Professor Robert W. Ellis, New York University; A. McBride and R. Wright, U. S. Bureau of Animal Industry; E. T. Davison, U. S. Quarantine Station, Athenia, N. J.; Robert Simms, Clifton; E. A. Schmarz, Hoboken; R. C. Newton, M.D., Montclair; H. D. Casler, East Orange; H. K. Berry, Paterson; J. P. Lowe, Jr., and Wm. Uehlein of Passaic, N. J.

Honorable Amos H. Radcliffe, Mayor of Paterson, addressed the members and welcomed them to the city. In well chosen words he commended the organization and members of the profession for the important work and service they were rendering to the country in this war crisis, saying that he knew of no body of men that could do more to conserve the animal food supply of the nation. He emphasized the fact that true patriotism began in the home, extended to the city and then to the state and nation.

Dr. Thomas E. Smith of Jersey City, in his usual gracious and cordial manner, responded to the mayor's address and in behalf of the association thanked his Honor for his kind words of greeting.

Dr. Thomas E. Smith gave a very interesting report of the last meeting of the A. V. M. A., which was held at Kansas City.

Dr. James McDonough submitted his report as treasurer, which was received and referred to the auditing committee.

President J. Payne Lowe made his annual address.

The secretary read a telegram from Lieutenant M. A. Pierce expressing his regret at not being able to be present.

Dr. W. Horace Hoskins read an interesting paper in which he urged the use of horse meat as human food.

Recess of one hour for lunch.

Meeting reconvened at 2:20 P. M.

Dr. William Herbert Lowe of Paterson read a paper on "Conservation of Food" which was freely discussed by Professor Ellis, New York University, Dr. Newton of Montclair and others.

Dr. E. T. Davison, U. S. Quarantine Station, Athenia, presented a paper on "The Tuberculin Retest". This paper was also freely discussed by Drs. Hopper, Harrison and others.

Lieutenant Martein and Lieutenant O'Dea gave interesting talks on "The Veterinarian in War Service".

The following resolutions were unanimously passed by the association:

Proposed by Wm. Herbert Lowe, seconded by Thos. E. Smith:

WHEREAS, The propagation, raising, developing and maintenance of our animal industry upon scientific principles is of fundamental and paramount importance to agriculture, prosperity, and the food problem which now confronts this state and nation; and

WHEREAS, The conducting of this great industry from an economic as well as a health standpoint demand the best that science has to offer for its accomplishment that the highest degree of efficiency may be obtained that the industry may be fostered and promoted in a manner and under conditions favorable to the avoidance of infection and the devastation of disease and loss; and that every means known to science and practice be employed in the eradication of any infection, contagion or communicable disease that may occur within our borders; therefore, be it

Resolved, By the Veterinary Medical Association of New Jersey, in convention assembled at Paterson, New Jersey, Jan. 10, 1918, realizing its patriotic duty, would place itself upon record at this crisis in the history of our nation as ready and prepared to do our part in aiding the state and national authorities in the production and conservation of the foodstuffs of the country; and be it further

Resolved, To the end that the most efficient service may be rendered, in addition to the regular military service in the Veterinary Corps and the Commissary Department of the United States Army, that the members of this association, individually, as well as the official organization of the veterinary profession of New Jersey, do hereby offer, in a most hearty and patriotic spirit, its best services to agricultural, live stock and kindred organizations and to the authorities of the State of New Jersey and to the Government of the United States; and be it further

Resolved, That a copy of these resolutions be sent to the Governor of this State, the Secretary of Agriculture at Trenton, and to the President of the United States.

Proposed by J. B. Hopper, seconded by T. E. Smith:

The Veterinary Medical Association of New Jersey in annual meeting assembled have this day approved of the use of horse flesh as a valuable human food of great nutritive value, wholesome and safe under the usual meat inspection service of the Bureau of Animal Industry.

We strongly urge Congress to immediately make available the upwards of two millions of horses on our western ranges by an appropriation of one hundred thousand dollars to establish equine meat inspection that it may be added to our animal food supply and at a price that it will be made available to our wage earners.

Proposed by T. E. Smith, seconded by J. B. Hopper:

WHEREAS, The State of New Jersey is contemplating the construction of state-wide highways; and

WHEREAS, Agriculture and the future welfare of the state is largely dependent upon the preservation and use of the horse; therefore, be it

Resolved, That the Veterinary Medical Association of New Jersey in annual convention assembled in Paterson, Jan. 10th, 1918, respectfully urge the Honorable Walter E. Edge, Governor of New Jersey, to make suitable provision for the travel of the horse in the construction of these highways.

Proposed by J. B. Hopper, seconded by William Herbert Lowe:

WHEREAS, The Veterinary Medical Association of New Jersey in annual convention assembled at Paterson on Thursday, Jan. 10th, 1918, has learned with regret of the illness of the Honorable William E. Hughes; therefore, be it

Resolved, That this association sends their sympathy and hopes for his speedy recovery.

Proposed by William Herbert Lowe, seconded by J. B. Hopper:

WHEREAS, The Veterinary Medical Association of New Jersey in annual convention assembled at Paterson on Thursday, Jan. 10th, 1918, has learned with profound regret of the death of the distinguished veterinarian, Alonzo D. Melvin, late Chief of the United States Bureau of Animal Industry; therefore, be it

Resolved, That this association extend its sincere sympathy to his family and that a copy of these resolutions be spread on the minutes.

Proposed by T. E. Smith, seconded by J. B. Hopper:

WHEREAS, Dr. John R. Mohler has been appointed Chief of the U. S. Bureau of Animal Industry; and

WHEREAS, In this appointment ability and long service in the Bureau have been recognized; therefore, be it

Resolved, That the Veterinary Medical Association of New Jersey in annual convention assembled at Paterson, Jan. 10th, 1918, heartily endorses his appointment to this most important position; and be it further

Resolved, That a copy of this resolution be sent to Secretary Houston and to Dr. Mohler.

In behalf of the association Dr. T. E. Smith presented to ex-President Harrison a handsome leather handbag as a slight token of the esteem in which he was held by his fellow members.

Dr. Harrison, responding, expressed his appreciation and said that he hoped that he would continue to merit the association's esteem.

The following candidates, being approved by the executive committee, were unanimously elected to membership: Dr. J. H. McNeil, Trenton; M. K. Mann; H. K. Bloomsbury; Dr. H. K. Casler, East Orange; Dr. Robert Simms, Clifton.

The election of officers for the ensuing year then took place with the following results:

President, Dr. J. Payne Lowe, Passaic; first vice president, Dr. J. H. Conover, Flemington; second vice president, Dr. L. P. Hurley, Hopewell; treasurer, Dr. James McDonough, Montclair; secretary, J. H. Haffer, Paterson.

Motion made by Dr. T. E. Smith and seconded by Dr. William Herbert Lowe that the place of holding the next semi-annual meet-

ing on July 11th, 1918, be referred to the executive committee with power. Carried.

Motion made by Dr. T. E. Smith and seconded by Dr. William Herbert Lowe that members of the association in the service of the United States Army be exempt from dues during their term of service, and also other members who may be called.

Motion made by Dr. William Herbert Lowe and seconded by Dr. T. E. Smith that the secretary be instructed to send greetings from this association to the members serving in the Army.

No further business being before the meeting, it was moved and seconded to adjourn.

R. W. BUTTERWORTH, Sec. pro tem.

IOWA STATE VETERINARY ASSOCIATION MEETING, AND FIFTH VETERINARY PRACTITIONERS' COURSE, AMES, IOWA

The Iowa Veterinary Association held its thirtieth annual meeting at the Veterinary School of Iowa State College, Ames, Iowa, on January 15, 16 and 17, 1918. The meeting was one of the most enthusiastic and successful ever held by the association. Over two hundred members were in attendance. The papers and reports presented were interesting and the discussions lively. The principal subjects discussed were Conservation Slaughter, Live Stock Inspection and the Accredited Herd System, Sclerostomiasis and Influenza in Horses, Black Leg and Hemorrhagic Septicemia in Cattle, and diseases of swine. Less time was devoted to the clinic than usual. However, each operation taken up was fully discussed, and carefully and thoroughly demonstrated, and opportunity given for each practitioner to make observations and ask questions. The following operations were demonstrated: Removal of nasal septum; quittor operation and quittor bandaging; resection of the perforans tendon for penetrating street nail; fistula of the withers; oophorectomy in the bitch; new methods of casting and restraint were also demonstrated.

The third day's program was conducted by the veterinary faculty as a one-day practitioners' course and was entirely devoted to a discussion of Diseases of Sheep as met with under ordinary Iowa farm conditions. Marked interest was shown in this comparatively new and rapidly developing field of practice by those

in attendance. Dr. J. H. McNeil of Trenton, N. J., assisted the veterinary faculty, and gave an interesting lecture with lantern slide demonstrations on "Animal Industry in South America".

The following were elected as officers of the Iowa Veterinary Association for the coming year:

President, H. B. Treman, Rockwell City; first vice president, T. W. Gidley, Malvern; second vice president, C. E. Juhl, Osage; secretary-treasurer, H. D. Bergman, Ames.

During the business session of the association a collection was taken for the relief of veterinarians and their families suffering as a result of the war, which totaled $555.00. It was also decided to secure additional donations from members not present, and if possible make the gift to this fund from Iowa veterinarians $1000.

H. D. BERGMAN, Secretary.

MASSACHUSETTS VETERINARY ASSOCIATION

The October meeting of the Massachusetts Veterinary Association was held at the Hotel Worthy, Springfield, on Oct. 17. At 6 P. M., 94 members and guests sat down to a dinner which was exceptionally good. It was gratifying to all to note the great improvement in service over the dinner of last year.

In the absence of the president, Vice President Lukes called the meeting to order. The records of the previous meeting were approved as read. Chairman Lukes then introduced Dr. Lester H. Howard as toastmaster for the evening. Dr. Howard very fittingly presided over the entire meeting, introducing the speakers in his usual masterly way. When in the course of his introductory remarks he made the statement that he was proud that the veterinary profession was going to have an opportunity to show its devotion and to fight for the country, the assemblage applauded lengthily.

Dr. W. Horace Hoskins of New York City was the first speaker. He eulogized the Eastern States Exposition for what it was doing and contemplated doing in the future. He described the efforts of the veterinarians to assist the country at this time, and pointed out many ways in which we might assist. He pointed out that although less than eight hundred veterinarians were needed for the army which is being raised at the present time, more than fourteen hundred offered their services; in other words

six hundred in excess of the number needed. Every state and every veterinary college in the country had offered its quota.

Dr. Thomas Maloney of Fall River was the next speaker. Inasmuch as he had just returned from Washington, his remarks were closely followed. He emphasized the fact that the profession is really on trial during the present crisis. He emphasized the fact that we must help by helping those in charge, and by offering our assistance rather than waiting to be asked for help. He gave a complete outline of the proposed Veterinary Corps, and stated that majors would be at the head of the Corps, captains being in charge of units, and lieutenants will be assistant surgeons.

The president then introduced Dr. Adolph Eichhorn of Pearl River, N. Y., who spoke on Modern Biologics. Dr. Eichhorn emphasized the fact that the expression "modern biologics" was a misnomer, because all biological knowledge is modern. He outlined the history of biologics from Pasteur up. In speaking of glanders, he stated that previously glanders has always followed the advance and retreat of all armies, whereas mallein has now eliminated this condition. As other illustrations of the value of biologics, he mentioned typhoid fever, diphtheria, and stated that pneumonia is now being cured by the use of a serum discovered by the Rockefeller Institute. This serum is now being used in the United States Army. In reference to hog cholera, Dr. Eichhorn stated that the method in which hog cholera was being controlled in Massachusetts was the best example of what could be done which had yet been brought forth. He stated that our method and results were being given all over America as the proper method of controlling hog cholera. Dr. Eichhorn spoke of the contention between practitioners and the commercial houses who urge a biological for everything. He urged that practitioners study biological conditions more carefully, so that they might be able to separate the valuable from the valueless products, and not be dependable upon drummers for commercial houses. Generally speaking, however, biologics are particularly valuable for contagious diseases.

Dr. W. G. Benner, in charge of the eradication of tuberculosis for New England under the Federal Government, was the next speaker. Dr. Benner stated that the cooperation of the herd owner is absolutely necessary, and that plans for the real campaign for the eradication of tuberculosis are not really complete, but that the appropriation had been given and the work started. He stated

that the campaign was cooperative between the state and government, and that at the present time it was largely educational. Dr. Benner stated that the movement was due largely to the demand from cattle owners for information from the Bureau of Animal Industry as to whether cattle free from tuberculosis could be purchased. He stated that the Bureau had been simply overwhelmed with requests for assistance in this respect. Dr. Benner stated that the cooperation in New England thus far had been very good, and that as far as the work had been carried on, 9% of the animals tested have reacted. He stated, however, that the work was largely in herds which were not being treated for the first time.

Boyden Bearce, Commissioner of Domestic Animals for Maine, was the next speaker. He complimented Dr. Howard, and stated that practically all of the Live Stock Commissioners of New England were dependent to a certain degree upon the good advice of the present Commissioner of Massachusetts. He urged more and healthier live stock throughout New England.

Mr. J. M. Whittlesey, Commissioner of Domestic Animals for Connecticut, was the next speaker. Mr. Whittlesey spoke largely upon the present severe outbreak of rabies which is affecting his state, and stated that a restraining order was now in effect in more than one hundred towns in Connecticut. Speaking of the large number of dogs, he stated that in Connecticut there were approximately 7000 dogs, or one dog for every 4½ children of school age.

Drs. Austin Peters, J. B. Paige, and John DeVine of Goshen, N. Y., spoke briefly.

Moved by Dr. Louis Paquin, seconded by Dr. Thayer, that a rising vote of thanks be extended to Dr. Hoskins for the work which he has done for the Army Veterinary Service. Carried.

Dr. Cleaves suggested that in his opinion it would be wise for the association to plan earlier for the Springfield meeting for 1918, so that other states might be made aware of the fact. Moved by Dr. Cleaves, seconded by Dr. Gardner, that the association meet in Springfield in October, 1918. Carried.

The secretary spoke regarding the negligence of members in returning post cards sent out by committees and the secretary. He stated that last year out of approximately 150 post cards sent out, 40 answers were received. This year, from 160 post cards sent, approximately 38 answers were received. He insisted that this was not fair either to the entertainment committee or the sec-

retary, and suggested that these officers had the right to expect this much consideration from every member of the association.

Adjourned at 10 P. M.

EDWARD A. CAHILL, Secretary.

INDIANA STATE VETERINARY MEDICAL ASSOCIATION

Twenty-second Annual Meeting

The meeting was called to order at 10 A. M., Thursday, January 10th, by the president, Dr. A. F. Nelson, in the large assembly hall of the Claypool Hotel, Indianapolis, Ind. Over two hundred members responded to roll call.

At 11 A. M., the Honorable Will H. Hays, Chairman of the State Council of Defense, addressed the assembly upon the "War, the Veterinary Profession and the Meat Production". Following this very forceful address an open discussion of the patriotic duties of the veterinarians of Indiana was led by Dr. H. J. Kannal, President of the State Board of Veterinary Medical Examiners.

At 1:30 P. M., Professor H. E. Allen of the Department of Animal Husbandry, Purdue University, gave one of the most interesting talks that was ever listened to by the association. His subject was "Feeds and Feeding of the Meat Producing Animals". The ground was so thoroughly covered by Professor Allen that it left no room for discussion.

Dr. L. C. Kigin, Purdue University, read a paper on the "Common Diseases of Sheep". This paper was very interesting and exceedingly instructive, and was discussed by Dr. R. A. Craig, Chief Veterinarian, Purdue University.

On account of the great length of the program for the afternoon session, Dr. K. L. Kixmiller's paper on "Contagious Abortion" was read by title. Dr. J. M. Funkhouser read a paper on "Hemorrhagic Septicemia of Cattle" and Dr. J. L. Axby, member of the State Examining Board, in his discussion of this paper, took into consideration the hemorrhagic group of diseases and compared hemorrhagic septicemia in other animals with hemorrhagic septicemia of cattle. Doctor Axby has had a very wide range of experience with this type of diseases.

Dr. H. J. Kannal presented a paper on the "Transportation and Interstate Movements of Live Stock". The discussion of this paper was so interesting and heated that it was again taken up

during the evening session. A very active interest was manifested in this subject by the federal men interested in cooperative control work.

Dr. C. W. Power's paper on the "Common Infectious Diseases of Swine" covered a wide range of troubles so frequently met with. This paper was discussed from a practical standpoint by Dr. O. L. Boor and by Dr. J. D. McLeay, Professor of Bacteriology at the Indiana Veterinary College, who took up the bacteriological phases in a very interesting manner.

Dr. Fred W. Graves reported a case of "Mixed Infection of Swine" in a manner that appealed to everyone present.

The association was greatly honored by Professor A. H. Baker of Chicago, Ill., and everyone enjoyed his paper upon the subject of "Pneumonia".

The meeting adjourned at 10 P. M., to meet in the clinic room at the Indiana Veterinary College where the following clinics were presented:

CLINICS. Dr. W. B. Craig took up the regional anatomy and the surgical technic of fistulous withers in horses, and during the morning operated upon three cases, giving all present a very excellent opportunity to observe the different methods of operating upon each individual case.

Dr. J. W. Klotz demonstrated Professor Williams' operation for sterility following contagious abortion, in a five-year-old Holstein cow.

Dr. Peterson operated on a cryptorchid. A case that was much out of the ordinary, from the fact that an inguinal fistula due to a deep-seated abscess was present.

Dr. H. G. White of Kokomo operated upon a complicated case of stringhalt.

Dr. T. A. Sigler operated upon a case of roaring. This case had presented some mystifying manifestations of the disease but proved to be a case requiring laryngotomy.

Dr. J. W. Klotz operated upon a cryptorchid in record breaking time. It required about seven minutes from the time the horse was brought out to be cast until he was again on his feet.

A case of tenotomy was operated on by Dr. W. B. Craig later on in the afternoon, as well as a number of other interesting cases, and as is generally the history in the past, the clinical cases were so

numerous that at least one-half dozen cases were left over at the close of the day.

Officers for the year 1918: Dr. Roy B. Whitesell, now a lieutenant in the United States Army, due to the fact that he had been vice president for the two preceding terms, was elected honorary president; Dr. J. L. Axby, Lawrenceburg, president; Dr. Payson Schwin, Elkhart, vice president; Dr. J. W. Klotz, Noblesville, reelected treasurer; Dr. G. H. Roberts, Indianapolis, reelected secretary.

Following is the report of the resolutions committee:

WHEREAS, The United States of America being in the throes of the greatest war in the world's history, calling for concerted and united action on the part of every citizen and every association of citizens; be it therefore

Resolved, That we, the members of the Indiana Veterinary Medical Association, do hereby and hereon sincerely pledge ourselves, individually and collectively, to stand behind the United States Government and its President, the Hon. Woodrow Wilson; the State Government and its Governor, the Hon. J. P. Goodrich; in all their war programs, which may have been or shall be promulgated; be it further

Resolved, That a copy of this resolution be spread upon the minute record of this association.

WHEREAS, It is known that many of the pharmaceutical and biological houses sell directly to the laity, or have agents who sell direct to the laity; therefore, be it

Resolved, That we, the members of the Indiana Veterinary Medical Association, individually and collectively, agree not to patronize any biological or pharmaceutical establishment which sells its products directly to the laity; be it further

Resolved, That the secretary of the association be instructed to write all State Veterinary Organizations advising of this action and to the American Veterinary Medical Association and urge that the same action be taken up by their membership; be it further

Resolved, That the secretary be instructed to send a copy of this resolution to all Veterinary Medical Journals asking them to refuse to accept advertisements from any firm selling their products directly to the laity; and be it further

Resolved, That the secretary be instructed to mail copies of this resolution to all biological and pharmaceutical houses.

Signed,

DR. J. L. AXBY, DR. J. C. RODGER, DR. C. W. POWERS,
Committee on Resolutions.

G. H. ROBERTS, Secretary.

PRACTITIONERS' COURSE

NEW YORK STATE VETERINARY COLLEGE, NEW YORK UNIVERSITY, NEW YORK CITY.

The following outline was prepared:

THURSDAY, FRIDAY AND SATURDAY, JANUARY 24, 25, 26, 1918

CARNEGIE HALL, THURSDAY, JANUARY 24, 1918

10:00 A. M. Announcements—Dean Hoskins.
10:30 A. M. Review of the Lymphatic System and Its Functions—Henry Henning, V.S.
11:30 A. M. The Teeth; Determination of Age; Their Influence on Digestion and Nutrition—J. G. Dolan, D.V.S., D.D.S.
12:30 to 2:00 P. M. Recess for Luncheon.
2:00 P. M. Milk Survey Problems—Russell Raynor, Ph.B.
3:00 P. M. Transportation Problems of Army Horses—Robert McAuslin, D.V.S.
4:00 P. M. Economic Importance of Parasitic Diseases—Charles S. Chase, D.V.S.
5:00 P. M. X-Ray Progress in Comparative Medicine—Lieut. Louis Griessman, N. A. V. Corps.

FRIDAY, JANUARY 25, 1918

10:00 A. M. Some Daily Observations in Equine Practice—Robt. W. Ellis, D.V.S.
11:00 A. M. Newer Biological Products—Alexander McNeil, M.D.
12:00 Noon. Better Methods of Horse Shoeing—James McDonough, D.V.S.
1:00 to 2:00 P. M. Recess for Luncheon.
2:00 P. M. Tuberculosis in Our Dairy Herds—J. F. DeVine, D.V.S.
3:00 P. M. Eradication of Tuberculosis in Accredited Herds—J. A. Kiernan, D.V.S.
4:00 P. M. Control of Glanders and Rabies—A. Silkman, D.V.S.
5:00 P. M. Value of Standardization of Drugs—T. B. Rogers, D.V.S.

SATURDAY, JANUARY 26, 1918

9:00 A. M. New Remedies in Veterinary Medicine—T. B. Rogers, D.V.S.
10:00 A. M. Sanitary Control Work—Wm. H. Park, M.D.
11:00 A. M. Actinomycosis—Wilfred Lellman, V.S., M.D.
12:00 Noon. Special Aspects; Complications of Everyday Diseases of Equines—Chas. Schloemer, V.M.D.
12:45 to 2:00 P. M. Recess for Luncheon.
2:00 P. M. Organization of the Army Veterihary Corps—W. Horace Hoskins, D.V.S.
3:00 P. M. Control Work in Infectious and Contagious Diseases—Adolph Eichhorn, D.V.S.
4:00 P. M. Visit to the American Society Prevention Cruelty to Animals Hospital, 24th Street and Avenue A.

COMMUNICATION

ARMY VETERINARY SERVICE

Chicago, Ill., January 10th, 1918.

Editor Journal of the American Veterinary Medical Association:
Ithaca, N. Y.

Dear Sir—I have just read the article on the Army Veterinary Service in the January number of the *Journal*. Personally, I think the writer is discriminating against the private institutions in this country. He states the qualifications of a state university graduate and says that from these men a very efficient corps could be organized in the Army.

The subject of SCHOOLS is a very prone one for argument at the present time, especially in the reserve corps of the Army. In this particular place it is a prominent subject, as graduates from state universities have been favored in the promotions.

I do not see what induces the *A. V. M. A. Journal* to publish such articles knocking the private institutions, nor the A. V. M. A. committee to recommend that certain private schools be dropped from the list with no apparent cause, when a large percentage of the members of the A. V. M. A. are graduates of private institutions, in fact, as well as I can learn, the majority of members are private school men.

I also notice you quote the veterinarians appointed from civil life and others already in the regular corps, authorized to assist in the reorganization of the veterinary corps. When this board was formed and began their work, injustice was the dominating result. Men from state universities were favored with the promotion whether or not they were adapted to the service or had any previous experience. In fact, very many of them were 1917 graduates. Men who were in the service the longest and who had had years of experience, some even being recommended for promotion, were not considered.

This act has encouraged a feeling of dissatisfaction among the older men, which is quite natural. The aim of the veterinary corps is efficiency, but I do not see how an efficient corps can be organized and maintained under this method of promotion or reorganization.

A SUBSCRIBER AND MEMBER OF THE A. V. M. A.

—Dr. H. W. Willis, formerly at Rushville, Ind., is now connected with the Extension Division, Utah Agricultural College, at Logan, Utha.

REVIEWS

PRACTICAL VETERINARY PHARMACOLOGY AND THERAPEUTICS

HOWARD JAY MILKS, *D.V.M.*
Professor of Therapeutics and Small Animal Clinic, New York State Veterinary College at Cornell University, Ithaca, N. Y.
Published by The Macmillan Company, New York, 1917. Price $4.25.

This new publication just from the press of the Macmillan Company, New York, should attract the attention of all progressive veterinarians, as well as the students in the various colleges. It will supply a long felt want in the English veterinary literature on this particular subject. In the preface the author states that "this book is intended for a practical text on Veterinary Materia Medica, Pharmacology and Therapeutics". In glancing through the text one is particularly impressed with this idea, and feels sure that the author's ambition has been realized.

Chapter I deals with definitions of the various terms used in connection with this particular subject. They are brief but fully defined.

Chapters II to VI give in detail definitions of Pharmacy, Pharmacopeia, Dispensatories, etc., metrology—apothecaries and metric systems—with approximate equivalents in each. This makes it easy for the student or practitioner to use either system without the usual difficulty of figuring out equivalents. Directions for weighing and measuring different materials are given in full. Chapter III defines the various pharmaceutic operations which is very convenient and valuable to the student before taking up the study of the preparation of different drugs. In Chapter IV the author has given some excellent and definite information in regard to the dispensing of drugs. Too many practitioners and students show negligence and carelessness in dispensing their drugs in a neat and attractive manner. The information contained in this chapter should be applied to practice. Chapter V describes briefly the various pharmaceutical preparations with their classification, etc. The solubility of drugs is considered in this chapter and is of great importance. The author has arranged the various materials in groups which is very convenient in determining their solubility in different solvents. A very brief but complete statement of the

different forms of incompatibility is also considered, which should be studied carefully before drugs are combined and dispensed. We believe that too many practitioners and students are careless in this regard. A careful study of the author's statements in this matter would reduce errors to a minimum.

Prescription writing, sufficient for the student's needs, is discussed at some length in Chapter VI. The various parts of a prescription are discussed fully with illustrations in each case. All of the necessary rules are also given so that there should be no difficulty in becoming quite proficient in all phases of prescription work. This information is given quite in detail but concise so that it is immediately available.

Latin words and phrases with their abbreviations and English equivalents are given which would be of great help to the student.

Chapter VII contains the introduction to Pharmacology which explains the local and general action of drugs, and factors which modify their action. The different methods of administration of drugs are also given in detail. A statement is made at the close of this chapter "what is necessary to learn about drugs", and the outline as given would be of material assistance to the student in systematizing his study of pharmacology.

Chapters VIII to XXIX embrace the study of pharmacology proper. The classification and description of the drugs are all that could be desired. The study of the individual drugs is very complete and the outline strictly adhered to. The practitioner and student will be able to obtain the very latest information concerning the newer as well as the older preparations.

Chapter XXIX gives a very brief discussion of the diagnostic agents (mallein and tuberculin).

In Chapter XXX, which concludes the book, the author has taken up briefly the discussion of bacterins, serums, vaccines and antitoxins, in which they are fully defined. This subject is brief but sufficient to show the importance of these agencies in therapeutics.

The book is neat in appearance, well bound, and the paper and type well selected. The whole book indicates a great deal of painstaking care and labor on the part of the author. The veterinary profession is to be congratulated on having such a commendable work made available for its use. O. V. B.

THE AMERICAN ILLUSTRATED MEDICAL DICTIONARY

By W. A. Newman Dorland, A.M., M.D., F.A.C.S.
New (9th) Edition Revised and Enlarged. Flexible Leather $5.00 net; thumb index $5.50 net.
Published by W. B. Saunders Co., Philadelphia and London.

In the absence of a dictionary devoted exclusively to veterinary terms, the veterinarian has no recourse except as a medical dictionary may meet his needs. Dr. Dorland evidently had the needs of the veterinarians in mind, for many strictly veterinary terms are included in addition to the many medical, chemical and biological terms which are common to both medical and veterinary professions.

The fact that nine editions have been called for in addition to reprinting the work several times between new editions evidences the wide popularity and esteem that has been accorded the dictionary.

The present edition is of large octavo size with 1179 pages, with 331 illustrations, 119 of which are in colors. It contains over 2,000 new terms, many of which have but recently been added to the literature. Many war words and war abbreviations have been added to bring the new edition strictly up to date. As a work of reference it is quite as valuable to the veterinarian as to the physician. P. .A. F.

NECROLOGY

WINFRED BERDELL MACK

Doctor Winfred Berdell Mack of the University of Nevada died at his home in Reno, January 18, after an illness of three months. Dr. Mack was a graduate of the N. Y. State Veterinary College at Cornell University and went to Nevada in 1906, where he filled the position of veterinarian and bacteriologist at the Experiment Station. In 1909 he was appointed director of the state hygienic laboratory, which position he held until 1915. He was appointed director of the state veterinary control service about 1911, and also held the positions of secretary to the state rabies commis-

sion, ex-officio state quarantine officer and secretary to the state board of live stock commissioners. Positions elsewhere had been offered but refused as he felt that Nevada had given him his first problems and opportunities and he desired to give what he had for the good of the state.

He was a member of the Society of American Bacteriologists and of the United States Live Stock Sanitary Association and of the honorary societies of Sigma Xi and Phi Kappa Phi and was resident secretary for Nevada of the American Veterinary Medical Association.

Dr. Mack was married in 1899 to Miss Olla H. Symonds of Fulton, N. Y., who survives him.

Impressive funeral services were held at the university gymnasium. The body was escorted by the cadet battalion.

Professor Norcross delivered an eulogy at the services and paid a tribute to the work Dr. Mack had so enthusiastically carried out in the state.

RESOLUTIONS ON THE DEATH OF DR. MACK

The Faculty of the University of Nevada desire to record their deep appreciation of the life and services of Dr. Winfred Berdell Mack, Professor of Veterinary Science and Bacteriology, Director of the State Veterinary Control Service, sometime Director of the State Hygienic Laboratory, State Quarantine Officer, Secretary of the State Board of Stock Commissioners, Secretary of the State Rabies Commission.

Direct and rugged in personality, resolute in decision, natural leader of men, practical scientist, protector of the animal industries of the State of Nevada, lover and citizen of his adopted state, he forced an often weakened body to do a life's work in a decade.

By his coming the University received a marked impetus in scientific research and wide service, the fruition of which he lived to enjoy.

(Signed) J. E. Church, Jr., R. C. Thompson, Committee.

The Student Body of the University of Nevada records with keenest sorrow the death of Dr. Mack.

Called from the field of earthly labor when but in the prime of life, and when it would seem his best years of service were in

the future, he leaves a record of achievement which is an enduring monument to his memory. Not only a recognized authority in the field of science, in which he became a specialist, by original research he added materially to the world's store of that knowledge which promotes the welfare and happiness of humanity.

Gentle in manner and unassuming, yet he impressed all who had the privilege of his acquaintance that he was a man, big in mind, and in heart and in soul.

The memory of his example will ever be an inspiration to the noblest ideals of the student.

A. S. U. N.,
FRANK HARRIMAN, President,
ADELE NORCROSS, Secretary.

EULOGY

DR. WINFRED BERDELL MACK

CHARLES A. NORCROSS

University of Nevada, Monday, January 21, 1918

The work of the day is done and Homeward is the call.
Weary of limb, because the task was great:
Serene of soul, because of task well done,
The Workman seeks his well earned rest.

Sunset glories light the Western skies.
Another Day—after the mystery of Sleep—will dawn,
And all His Destiny thread its way,
As the Eternal Shuttle weaves in and out
The Warp and Woof of the Known Today
And the Unknown of Tomorrow and Eternity.

So shall he go to sleep, serene of soul!
The task well done, the service to its fullest measure given.
What more he would have done some other shall be called upon to do—
For him the Homeward Call.

In his philosophy—gleaned from the profoundest Wisdom of the Ages,
Enriched by his own experiences,
And tested in the splendid laboratory of his trained mind—
The Homeward Call found him the Great Researcher still—
Serenely ready and expectant of the phenomena
That subjectively would solve for him
The riddle of the Why and Wherefore of Us All.

Life, to him, was the Deathless Principle behind all things—
Manifest for a brief cycle as a Transient Guest within our clay;
Then leaving the Clay behind as a cast-off garment,
And going, we know not Whence, at the Homeward Call.
—But Going Whence, unfettered of the shackles worn today!

He held with Maeterlinck, that "Death is the Glorious Adventure",
And with Omar—"For if the Soul can fling the Dust aside
And Naked on the air of Heaven ride,
Were it not a shame, were it not a shame,
In this clay carcass crippled to abide."

In his Philosophy—our Heritage is the phenomena of all Time;
The span of all the Yesterdays and the field of the Tomorrows—
Not the transient Hours of this Day, and then Eclipse!

Faith, anchored on the Rock of a knowledge so profound,
Shines as a Beacon, set to guide our humbler way!

Homeward Gone—and Here, the tenantless Clay
Given back to the elements from which made.
Shall we find place for sorrow at this hour?
Not so! For Here we meet beside the Door
Twixt Our Today and All the Whence of Life.
Best Bow our heads and say:
"Thank God for Life; thank God for Death,"
Lay gently down our flowers and go our way.

Homeward gone—yet shall we speak of him today.
Say each of us: "He was a brave true Gentleman."
That he walked stalwartly and found kinship with strong men.
There was in him nothing that was mean or petty;
But there was in him strength and fortitude;
The courage of strong convictions,
The right and might of leadership.
He held unswerving to his concepts of Right and Duty,
No man could move him against his will.
The self respect of true manhood was his,
And he had the modesty of true greatness.
He hated evil, sham and hypocrisy with all the vehemence of his strong nature.
He was quick to resent and slow to forget a wrong—but in the end forgave;
And for the failings of us all he had Charity.
Say that we found in him the capacity for deep and lasting friendships, and the Ways that inspired affection.
And tenderness and devotion were his and they glorified his fireside.
A brave true Gentleman! He bore his part in life strongly and without reproach.

Let us place upon this once quickened Clay Laurel for the Nobility of the Manhood Homeward Gone.
But we shall say more: The great talents Nature gave him he trained to splendid usefulness;
His scientific contributions in his chosen field of research have been as marked as those of any man of his time;
He had come to be recognized among the foremost men in America in his profession;

His public services in this, his adopted State, can only be measured in terms of value by enormous sums;
He spent his frail strength in that service without stint, seeking no large rewards; content with the supreme consciousness of Duty done.
So, also let us place upon this gentle Clay Laurel for Service rendered his Profession and the State.

But we shall say more: He came to the University of Nevada eleven years ago.
He gave to it, likewise, a Service the worth of which no man may measure.
To Faculty and Student, as teacher, counselor and Man, he was an inspiring influence;
His part in the making and moulding of this great institution has been incalculable;
Today his memory is that of the most dominant figure that has been among us, with the one exception of Dr. Stubbs.
His monument will be found in the vision of this University throughout the years;
His epitaph is written in the hearts of us all.

Let us place, also, here, Laurel for the Work in the University of Dr. Winfred Berdell Mack.

And then, one final thing we shall all say: "He was a friend beyond compare!"
And in the name of Friendship lay beside the Laurel, our wreaths of Friendship's everlasting flowers.

Homeward Gone—and Here, the Tenantless Clay,
Given back to the elements from which made.
Shall we find place for sorrow at this hour?
Not so!—For Life Triumphant here is found!—
The Work of the Day is done and Homeward Gone the Soul!
Here we meet beside the Door
Twixt our Today and All the Whence of Life.
So let us bow our heads and say:
"Thank God for Life; thank God for Death,"
Lay gently down our flowers and go our way
Bearing the rich gifts His Work has left with us.

J. H. FOX

Dr. J. H. Fox died January 16 at Vancouver, B. C. He was a graduate of the Ontario Veterinary College of the class of 1888.

MRS. A. D. MELVIN

Mrs. A. D. Melvin died January 13, at her residence in Washington, D. C., about five weeks after the death of her husband, Dr. A. D. Melvin, the late Chief of the Bureau of Animal Industry.

MISCELLANEOUS

—Correction. On page 519 of the Proceedings Number substitute the name of Dr. Kartrude for that of Dr. Hardwicke in the nomination of Dr. S. H. Ward for vice president. On page 546, in the list of contributors, the word paid should be placed after the name of Dr. C. A. Nelson.

—A severe outbreak of scabies among the horses at Fort Sill was reported in December.

—The next regular meeting of the Hudson Valley Veterinary Medical Society will be held at the new County Court House, Eagle St., Albany, N. Y., February 6.

—Dr. F. W. Miller, formerly at Davenport, Ia., has been transferred to Chicago, Ill.

—Dr. Clark H. Hays, formerly at Kalamazoo, Mich., is now located at Indianapolis, Ind.

—Dr. C. A. Johns has removed from Medina to Akron, O.

—Dr. Nelson L. Nelson, formerly at Ames, Ia., is now with the 55th Field Brigade, Camp Sevier, S. C.

—Dr. W. E. Muldoon of Ithaca has received a commission as Second Lieutenant in the Veterinary Corps and has been ordered to Fort Oglethorpe, Ga.

—Our Equine Meat Supply. At a conference of veterinarians of New York, New Jersey, Connecticut and Massachusetts at the New York State Veterinary College, New York University, the use of equine flesh was considered and a resolution was sent to Congress urging that an immediate appropriation of $100,000 be made available to reestablish the inspection of horse meat, that the large number of these animals on the Western ranges be turned into the animal food supply for our people as well as the Allied Countries. That these pasture lands may be afforded for sheep and cattle growing or the lands tilled for an increase of our cereal productions to meet the extraordinary demands and the visible shortage.

Whereas, The present system of purchasing thousands of horses and mules and carrying them into infected and contaminated corrals and shelters in the various camps, subjecting them to the multiple infections—primary, and secondary is wasteful and

wholly unscientific from our knowledge of these diseases, their prevention and control.

We urge upon the War Department through the Surgeon General's office and its Veterinary Corps the immediate cessation of this wasteful plan of gathering its army of horses. That we at once adopt the conscription of acclimated horses in the large cities and towns and that we distribute the young, unseasoned and unacclimated horses to individual owners or in small groups, that they may be broken into the service they are destined to perform, without the tremendous death losses, now reaching upwards of a million of dollars, unfitting a large percentage of additional animals for any future useful army service and making every camp corral a distributing center of every known infectious and contagious disease of horses and mules, transferring these diseases to our animals over the seas, making ineffective in large measure our up-to-the-minute fighting forces.

—Hog Cholera Losses Reduced. Statistics collected in Indiana show that the number of hogs dying of disease in 1916 was very much less than in 1915, being 187,000 last year and 500,000 the previous year. The number lost last year is the smallest since statistics were first gathered in Indiana in 1883. A very large proportion of these hogs died of hog cholera, the one highly infectious disease of hogs that spreads from farm to farm, and may cover an entire community or county during the summer and fall.

* * * The heavy loss occurring in 1915 was probably due to the spread of hog cholera in the fall and early winter of 1914, because anti-hog cholera serum could not be secured. The loss from hog cholera should be considered a part of the loss resulting from foot-and-mouth disease. At the present time many farmers are having their hogs vaccinated as a precautionary measure. There are numerous small centers of infection over the state, but if these are properly taken care of, there should be less hog cholera in Indiana than occurred in 1916. In most cases these small outbreaks are cleaned up, but the danger lies in those cases where the people are not informed or are careless about allowing the disease to spread.—*Farmers' Guide.*